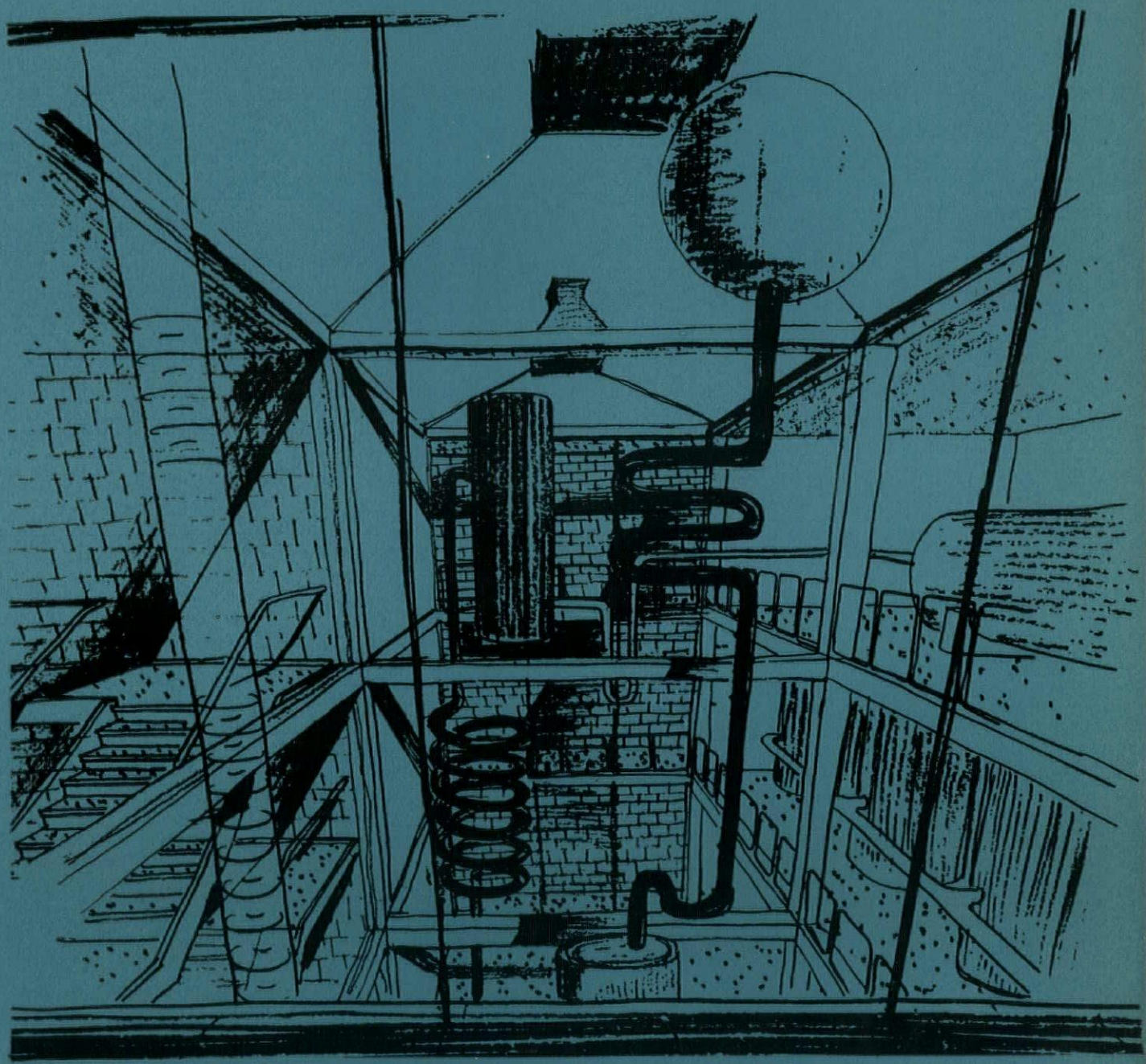
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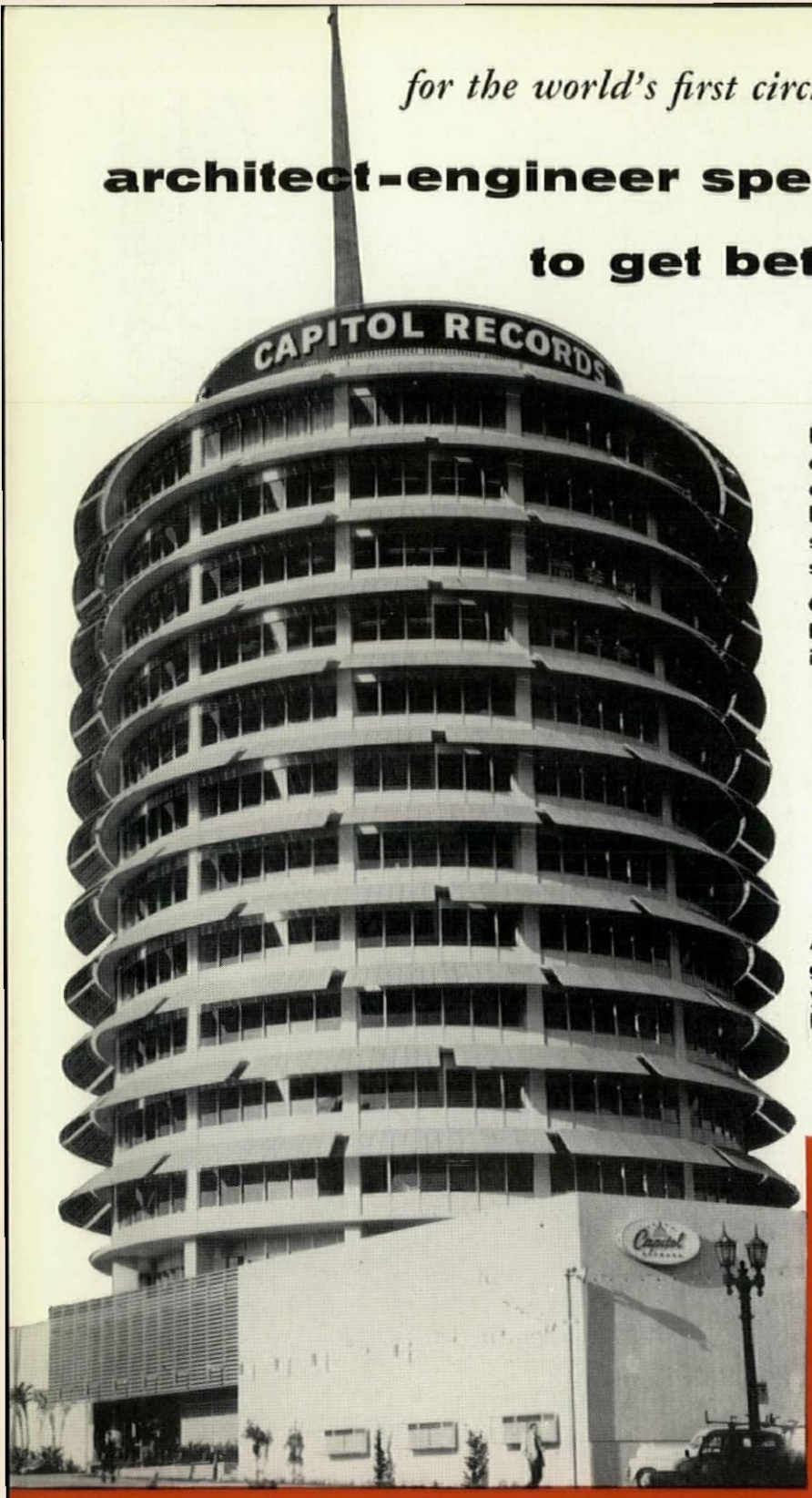
engineering laboratory: sketch by Joseph Passoneau

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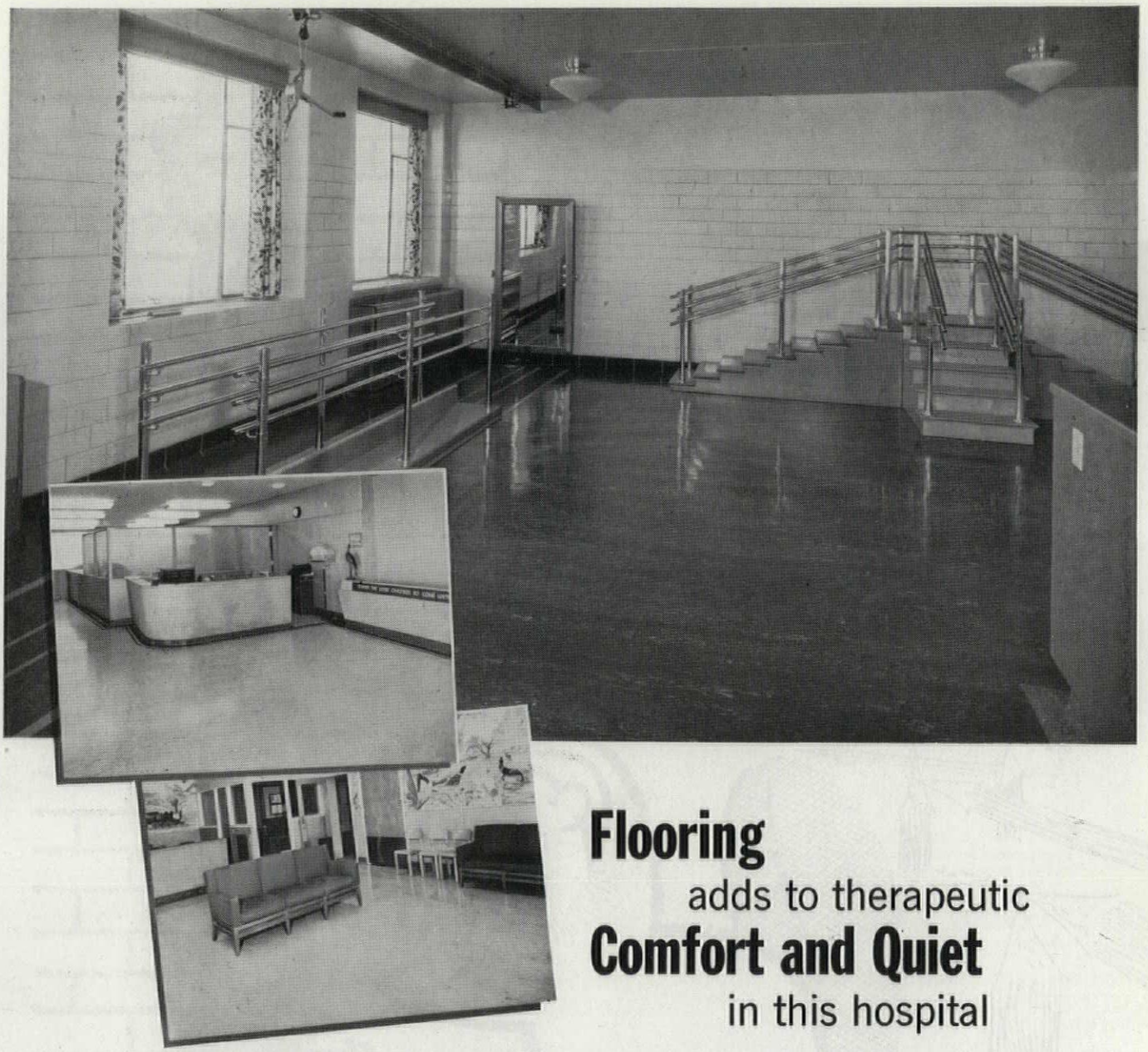
Capitol Records Office Building, Hollywood, California
Architect-Engineer: Welton Becket, F. A. I. A., and Associates, Los Angeles
Structural Engineer: Murray Erick Associates, Los Angeles
General Contractor: C. L. Peck, Los Angeles
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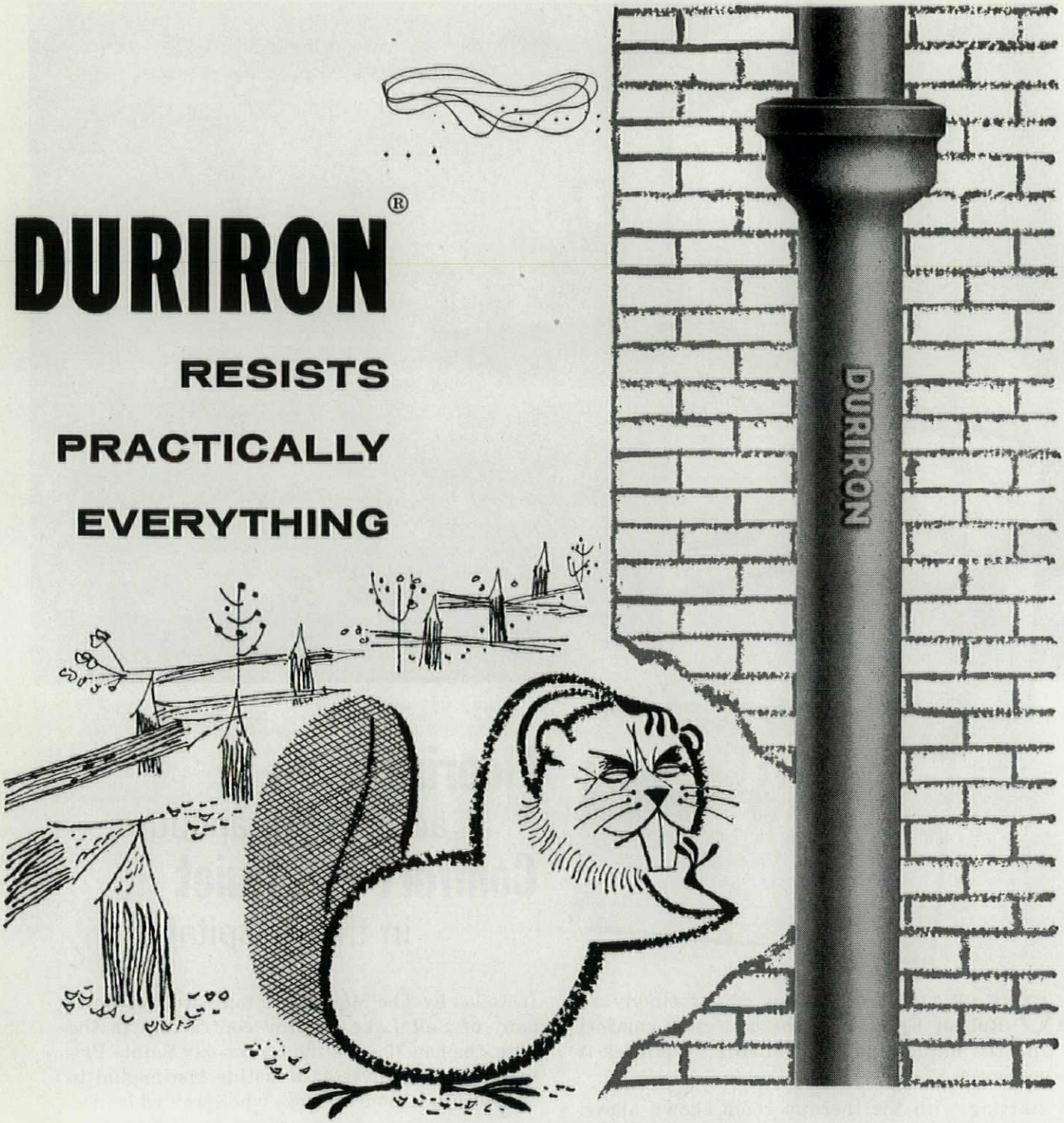
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PROGRESSIVE ARCHITECTURE

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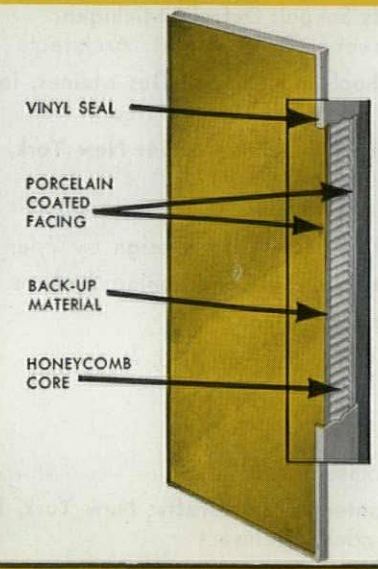
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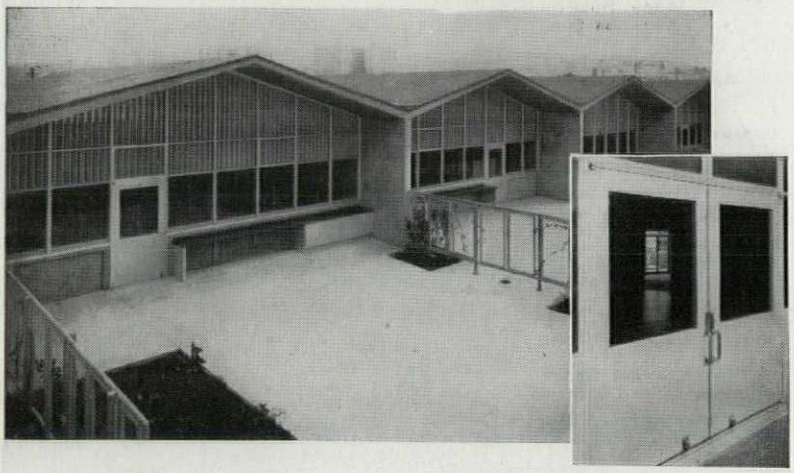


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It's the Law by Bernard Tomson

P/A Office Practice *article citing hazards to the Architect in underestimating Costs of a Building.*

Does the AIA Owner-Architect Agreement protect the Architect from an Owner's claim that the Architect guaranteed a maximum cost of construction? The answer would appear to be "no," in view of a recent decision of an Illinois appellate court (and similar decisions in other jurisdictions) in which it was held that an Owner may prove an oral promise by the Architect that the project in question will not exceed a certain sum, even though the parties had entered into a written AIA contract for the furnishing of architectural services.

This column has previously pointed out (IT'S THE LAW, *February 1949 P/A*) the hazards to the Architect of underestimating costs. Loss of compensation or a legal suit for damages for negligence may be the result if the Architect misjudges the cost of a proposed structure for which he is engaged to draw plans. It was recommended that the contract of employment should be so worded as to prevent a disgruntled Owner from seizing on an early estimate as the basis of a lawsuit, and it was urged that the Architect be as cautious as possible in giving estimates.

The issue raised, however, in the Illinois case was not the liability of the Architect for a negligent underestimation of costs, but rather the Owner's defense was based upon a breach of an agreement by the Architect under which, it was alleged, he undertook to furnish plans that could be executed within a particular price. In this case the Architect and the Owner entered into an AIA form contract for the furnishing of plans for the construction of a home. The Owner agreed to pay the Architect for his professional services a fee of 10% of the cost of the work, which was to be paid 25% upon the completion of preliminary studies, and an additional 50% during the period of preparation of specifications and working drawings. It was further provided that said payments were to be computed upon a "reasonable cost estimated upon such completed specifications and drawings, or if bids have been received, then computed upon the lowest bona fide bid or bids." The contract in respect to estimates further provided:

"When requested to do so, the architect will furnish preliminary estimates on the cost of the work, but he does not guarantee the accuracy of such estimates."

The plaintiff prepared the plans and specifications and eventually bids were received. The lowest bid received was $39,000. The Owner abandoned the project because of its cost and refused to pay the Architect's fees. The Architect instituted suit to collect his compensation.

The Owner contended in the trial that he had informed the Architect that the maximum amount he could afford for the house was $25,000 and that the Architect agreed that the house would not cost in excess of that amount. The AIA form, as prepared by the Architect, was signed without any changes and the Owner testified that, when he asked the Architect what the contract meant, the Architect said: "This is to keep you from changing horses in the middle of the stream."

The trial court ruled in favor of the Owner and denied any compensation to the Architect for services rendered because of his failure to furnish plans that could be executed for a cost of $25,000 or less. An appellate court affirmed this ruling.

It is a general principle of law that oral agreements, understandings, or conversations may not be introduced into evidence to vary or contradict the terms of a written agreement. The theory of this principle is that all prior negotiations are merged into the written contract. However, the Court in the Illinois case permitted the Owner to introduce testimony as to the alleged oral understanding relating to maximum cost, on the ground that this testimony did not vary or contradict the written agreement, but rather explained and completed it. The Court said:

"The form contract in the instant case is silent as to the style of the house to be designed, the number of its rooms, its dimensions, the quantity and quality of the materials to be used in erecting it, and so on. . . . 'There must be something outside the contract to determine these questions. The Architect must have had instructions outside the contract with which to undertake to comply, in the preparation of his plans' . . . . One of those instructions must have concerned the cost of the building . . . in the following—all involving similar or substantially identical AIA form contracts—parol evidence to prove an agreement as to maximum cost where the form contract was silent was held admissible. (*Citing cases*)

"Furthermore, to sustain plaintiff's contention that the cost is to be determined by the lowest bona fide bid, it would be necessary to hold that no matter how large the bid for doing the work, the Owner would be obligated to pay an architectural fee based on that amount."

The Court further pointed out that the Architect having furnished the contract form, it must be construed most strongly against him. The Court, in this connection, said:

"There is nothing in the contract, nor anything in the circumstances of this case to buttress plaintiff's contention. Expression of their intention could have been made clear. They provided the form contract. It is to be construed most strongly against them and any ambiguity resolved favorably to the defendant. . . .

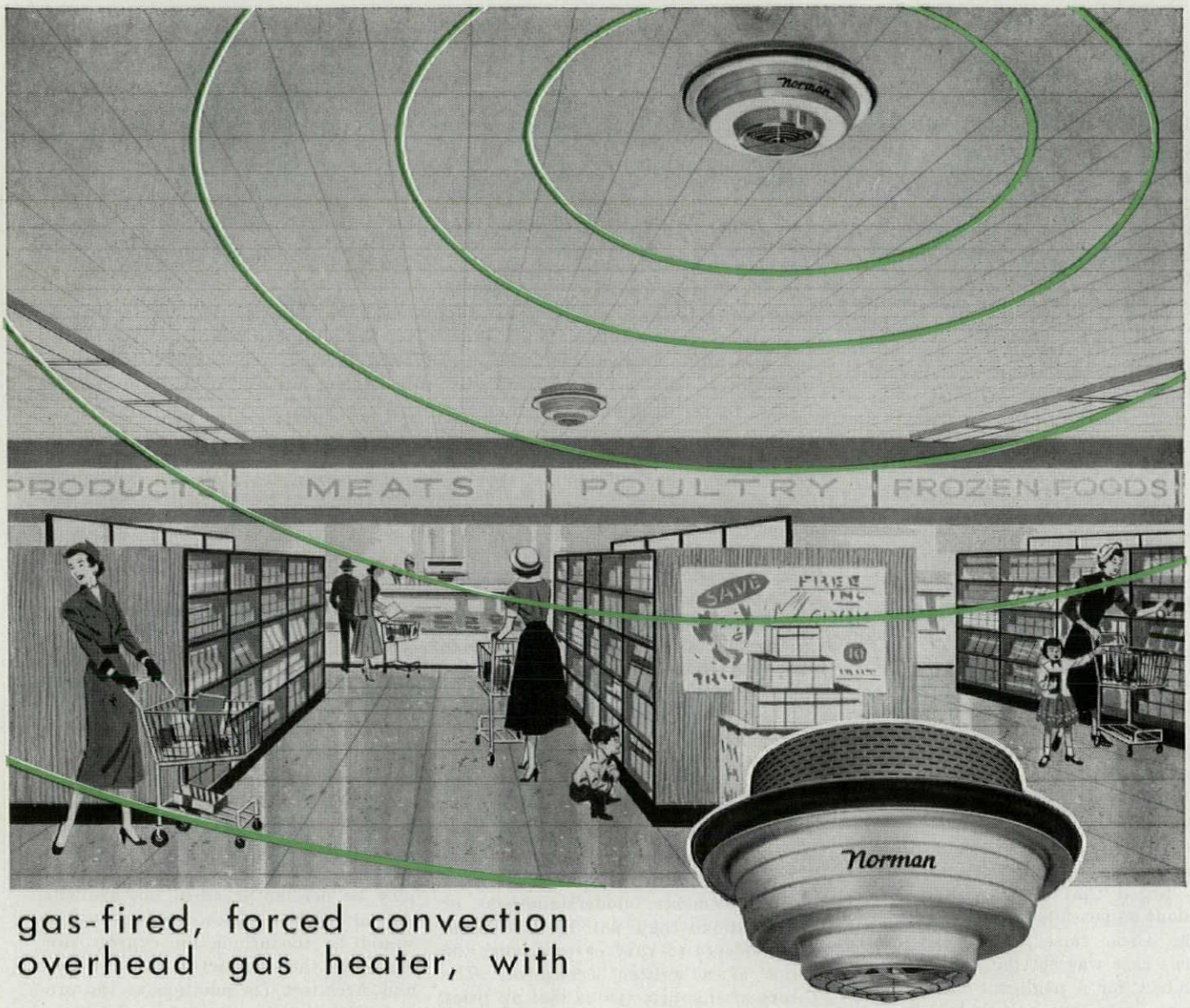
"It was not error for the trial court to admit testimony to explain the ambiguities and any incomplete portions of the contract."

From this decision it would appear that proof of an alleged oral agreement guaranteeing the maximum cost of the house would have been excluded if the written contract had set forth in detail a description of the project including the quantity and quality of materials to be used. Such a procedure, however, may be neither practical nor realistic. An alternative method of protection would be to include an express provision in the contract between Owner and Architect (in addition to the proviso that the Architect does not guarantee his estimate of costs) to the effect that the Architect does not guarantee that the building can be constructed within any particular cost, estimate, or limitation. This column has recommended the following language (IT'S THE LAW, *November 1956 P/A*):

"If requested by the Owner, the Architect will furnish preliminary estimates as to the cost of the Project. However, such estimates are not to be construed in any way as a representation, warranty, or agreement on the part of the Architect of the accuracy of such estimate or that the Project can be constructed for the amount thereof. The Architect's compensation under this contract shall in no way be affected by the correctness of such estimates."

Under the rationale of the cases discussed above, it would appear that such a clause would make it difficult for the Owner to claim successfully an oral agreement by the Architect pertaining to maximum cost.

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Mechanical Engineering Critique

by William J. McGuinness

P/A Office Practice *column on mechanical and electrical design and equipment, devoted this month to Planning Hospital Wiring.*

More than any other type of building, a hospital requires the most careful planning for electrical service, distribution, communication, and signal systems. Hospital governing boards, special consultants, architects, and engineers can use all available information to anticipate the requirements of the medical profession in its rapidly changing service to humanity.

In the course of the design of a new hospital plant near Philadelphia, Harry P. Swing of the Ballinger Company, Architects-Engineers, put together a framework of technical planning that provides an excellent check list against which to measure the needs for power, light, and communication. From this study, a number of important standards are summarized here.

The approximate limits of a power budget may be set up as 700- to 2600-w per bed (the upper limit including electricity for cooking and sterilizing). It is important that the selected capacity include a reserve that is sufficient for additional future needs, entirely aside from those contemplated to result from physical expansion of the building. This margin is for equipment not yet known, and it is predicated on the findings of national surveys which indicate that general power consumption has been doubling each decade. The additional capacity for a hospital above the total of known, immediate needs is estimated by some authorities at 20 to 80 percent.

Six vital qualities of electrical systems are discussed.

1. Safety. Explosions of anesthetics can be avoided by complying with Article 500, "Hazardous Locations," of the National Electric Code, and Bulletin 56, *Recommended Safe Practice for Hospital Operating Rooms*, of the National Fire Protection Association. Other requirements of these national authorities and of local municipalities must be met for safety against fire, shock, and damage to system.

2. Reliability. The serious consequences of even the briefest shutdown of service in a hospital are obvious. Assurance of some continuity can be had by several methods.

a. Two utility-company services, independent of each other, and capable of carrying the entire load.

b. One utility service for normal load, and one utility service, independent of the normal service, of sufficient capacity to carry emergency load.

c. One utility service for normal load and one stand-by generator for emergency load. The extent of stand-by provisions for emergency load will depend on the probable frequency and the duration of interruptions in the service of the utility system, but should, in any case, include the following essential loads:

Surgical and delivery suites
Stair lighting
Partial corridor lighting
Exit signs
Fire-alarm systems
Boiler-plant operation
Food refrigeration
Certain laboratory processes
At least one elevator
Incubator
Sterilizing and cooking

These critical loads should be picked up at once by an automatic throw-over switch. Special consideration must be given to operating-room lighting to provide for immediate supply during the time lapse in generator starting. The prime mover for the emergency generator is usually a gasoline or diesel engine. Gasoline will start more easily, while diesel fuel is less hazardous. Both require a starting battery which must be kept charged at all times. Reliability of the interior wiring system can be further increased by splitting the loads within given areas between two feeders.

3. Durability. Equipment and materials should be of the very best quality to insure reliability of operation and durability for long periods of service.

4. Appearance. The very nature of a hospital as an institutional building demands that more attention be given to clean, finished appearance of electrical equipment. This condition helps promote cleanliness in general housekeeping.

5. Expansibility. If the ultimate project is not to be constructed at one time, design must be arranged to permit future expansion with minimum change to any existing system.

6. Flexibility. This is not normally very important since the complexity of a hospital requires a definite space permanently assigned to each piece of equipment.

lighting patients' rooms

The adaptation of wiring to the special needs of a hospital is typified by the following example: Illumination of the patient's room, simple as it may appear, has provoked much discussion, and opinions are still divided as to the best methods. Basically, there should be low level, even, restful, general illumination throughout, with higher levels available for reading, examination, and in laboratories. General illumination can be achieved by:

a. Pendant mounted, incandescent, indirect units where excessive brightness, either at the fixture or on the ceiling, must be avoided.

b. The upward component of a fixed hospital-bed light.

c. The upward component of a portable floor lamp.

d. Cove lighting.

The reading and examination light can be:

a. Permanent, wall-mounted hospital bed light.

b. Clamp-type bed light.

c. Bed light with a permanently wall-mounted base, but with light unit removable for examination.

d. Portable floor lamp.

All of the above should be augmented by a glare-free light source over the lavatory. There should also be a night light illuminating the floor only. Switching should be done by noiseless, mercury switches. The nurse will switch the general illumination and night lights from the door. The patient should have control of his reading light. Lights in corridors should be located so that they will not be visible to any patient in bed with the room door open.

communication and signal systems

Nurses' call system is operated by the patient at the bedside or at the toilet. A dome light over the room door, an annunciator at the nurses' station, and a light and buzzer signal in the pantry and in the utility room are actuated. In addition, voice communication between patient's bedside and nurses' station is possible. A further refinement consists of a scanning device which will pick up sounds from each room in rotation for about ten seconds at a time. In this manner, the nurse is kept informed without leaving her station.

Doctors' paging system can be voice, radio, chime, or visual flasher system. If a voice-paging system is installed, its disturbance can be reduced by installing numerous low-volume speakers. In the radio system, the doctor carries a miniature receiver in his pocket which picks up a signal broadcast by a local hospital transmitter. The chime is an audible system, the flasher a visual system, both operating on a predetermined number.

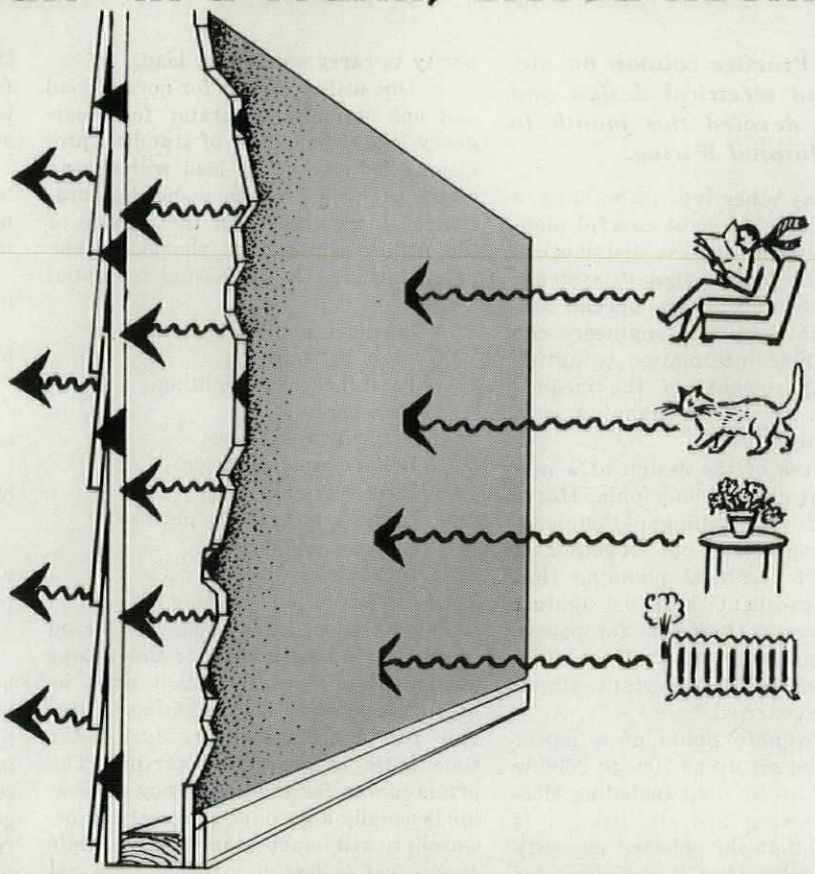
Similar specifications for doctors' register systems, fire-alarm systems, and the required components for special rooms such as laundry, X-ray, and others complete Swing's report.

Ever Feel a "Draft" in a Warm, Closed Room?

(RADIATION is the transmission through space of invisible heat rays. They have no temperature, only energy. When absorbed by a surface, their energy is transformed to HEAT. The surface of any object warmer than absolute zero—the Sun, You, Clothing, Wood, Plaster, an Iceberg, a Stove, a Chair, Paper, an Animal, will RADIATE to a colder surface.)

(CONDUCTION is the process by which a cooler object or particle is heated by direct physical CONTACT with a warmer one.)

(CONVECTION is the transfer of heat within air caused by the flow of the air itself.)



People often complain of "drafts" in a room with air-tight walls and windows. Why? To a large extent because, by Nature's law, warmth flows to cold by RADIATION as well as by CONDUCTION. Cold walls, too, draw heat out of contacting air by conduction, causing a downward current of cold air.

The exposed skin of people and the outer surfaces of their clothing lose heat as infra red heat rays flow from them with 90% emissivity to a cooler wall surface which has 93% absorptivity (and transforms the heat rays again to heat). If insulation is lacking, or has settled down, most of this heat is transmitted by radiation to the colder outer wall with 93% emissivity, absorbed, and then dissipated to the colder, outer air. So people are uncomfortable, perhaps only in spots. More fuel is then burned.

Multiple layers of aluminum in the wall space would retard convection; turn back heat rays with 97% reflectivity. When plaster is sufficiently warm, no net heat loss radiates from bodies to it; no current of cold air flows along the wall's surface. Comfort is maintained without unduly high temperatures or fuel costs.

In summer, the process is identical except for direction. Heat flow by radiation, conduction and convection is retarded by the multiple sheets of aluminum in the outer wall space. Interiors of rooms stay cooler, and the plaster surfaces are also often cooler than the body. Some heat would then *leave* the body for the colder wall surfaces, increasing body coolness and comfort.

You'll enjoy, as well as profit from reading Alexander Schwartz's recently published manual: "Heat Flow by Radiation in Buildings, Simplified Physics." The scientific background of heat flow, specific information on how to control it, data on the various types of multiple aluminum insulation, ratings of insulation performance, and installation techniques under many conditions are interestingly discussed in this liberally illustrated 48 page manual. A FREE copy is yours for the asking.

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Cost Control Assays and Estimates *by G. Szmak**

P/A Office Practice ***article expressing the point of view of the Construction Surveyors Institute regarding present estimating and bidding methods. While P/A Editors feel that most architects would argue with some of the points made by Szmak, the article raises issues which deserve to be discussed.***

Due to the uncertainties of current and probable future construction costs, architects and engineers are now designing projects and soliciting bids for buildings with sections to be added or omitted as separate estimates. In addition to several separate estimates, there is a series of alternates requested for reducing or increasing the cost of each building, or partial building, by substitution of other designs, materials, and labor. This increases contractors' estimating expenses two or three times above what they would be under normal competitive bidding, which is wasteful enough with too many bidders.

The practice of requesting an unlimited number of estimates and thus using contractors to provide cost data and assays on work which will not be awarded is an inexcusable imposition which has now become quite general. It is hoped that when bids have been received from six or more bidders, some proposal for a single unit or in combination may come within the buyer's budget or appropriated funds.

Such malpractice in the procurement of bids is not only criminally wasteful, but also downright ridiculous. It discredits the proficiency of designers and casts a reflection of doubt on the efficiency of the entire industry. This malpractice aside from its questionable ethics, has many other very definite economic disadvantages. It creates needless designing, specifying, and estimating, which are very costly as well as confusing.

1. Since the architect, engineer, or designer does not obtain unit prices on each item of construction for comparison of cost in detail, the practice in vogue does not provide the information necessary for designing economically. The total cost of a project is no more economical than the parts incorporated in its design.

2. When a designer has preliminary cost control assays and estimates beforehand, to eliminate unnecessary designs and estimates, the time conserved thereby advances the completion of a project. It also abolishes the need for hastily prepared incomplete drawings and specifications that must be revised and corrected endlessly.

3. Too many projects are now abandoned or designs rejected by clients because of the exceedingly high bids received. Consequently, designing and estimating fees are left unpaid. This causes more expense for estimating, arbitration, and law suits to settle these accounts.

4. Contractors and subcontactors are now so overloaded by a multiplicity of separate estimates and alternates that they cannot give proper attention and time required for close and accurate estimating. This increases construction costs because it decreases competition. Furthermore, a contingent allowance must be added to cover risks involved on account of hasty estimating. In addition to the confusion created by numerous estimates and alternates requested, the construction buyer is also paying an excessively high overhead for estimating time unnecessarily wasted by the bidders.

5. Due to a shortage of proficient designers, surveyors, and estimators now needed to cope with abnormal designing and estimating requirements, the compensation demanded by available but less experienced technicians is out of proportion to their economic value. This additional expense increases the already exorbitant building prices which discourage prospective buyers.

6. There is very little, if any, incentive for proficiency in estimating when at least ninety percent of the work done by analysts and estimators in contractors' offices is unfruitful wasted effort. No other worker's labor is spent so wantonly without satisfaction as that of an estimator. This situation urgently needs correction by abolishing duplication of surveys.

After all the wasteful designing and bidding has taken place, neither designer, contractor, nor owner has a positive means of controlling costs during the design, bidding, or construction stages essential for economical results. Professional assays, estimates, quantity analyses, and appraisals are available to architects, engineers, designers, contractors, and owners in need of cost-control data and surveys. The following recommendations are made for utilization of such services:

1. A cubage cost assay of the project should be made before the drawings are started. A preliminary estimate can then be prepared from tentative sketches and outline specifications to provide cost data not attainable by cubage or square foot methods. Progressive cost data can be provided during the development of design, providing the architect or engineer with cost changes due to modification of construction and materials suggested or required. Cost assays thus assist in making decisions and in keeping the project in balance with the preliminary cost estimate, budget, or appropriation.

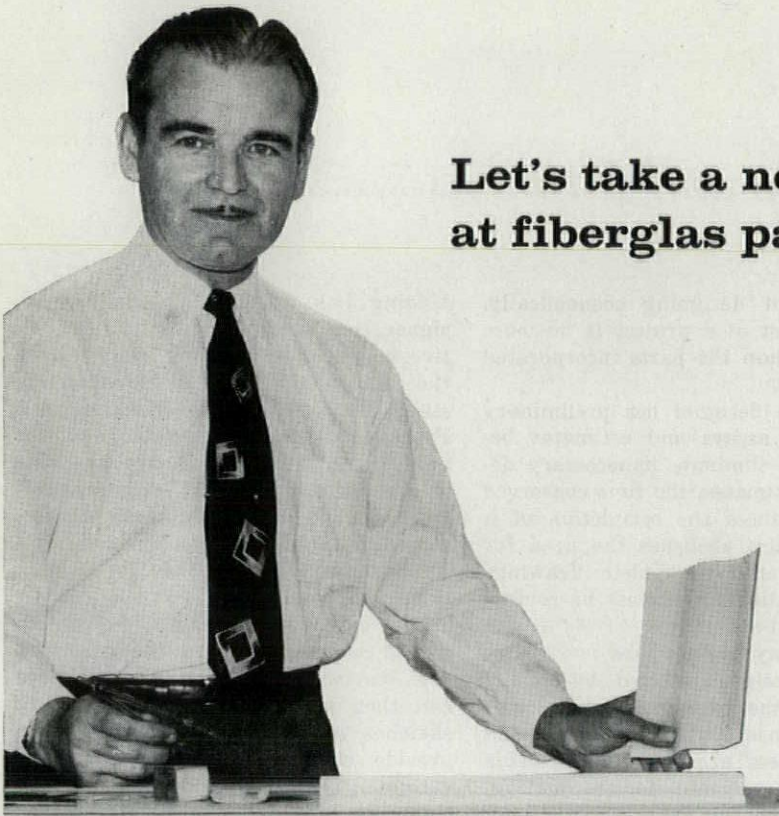
2. A detailed quantity analysis and appraisal should then be prepared by a reliable surveyor before completion of bidding documents, so that final modifications can be made in advance of bidding to prevent the project cost from exceeding the contemplated amount. This procedure reduces bidders' estimating to a minimum. Such an intermediate analysis and appraisal can serve to verify plans and specifications against errors and omissions. It will also confirm the contractors' and subcontractors' final bids.

3. On completion of the drawings and specifications, it is recommended that a construction quantity analysis, used as a Purchase Requisition, accompany the bidding documents for the basis of bids and contracts. This is the only sound basis for awarding negotiated contracts to a selected builder without the usual bidding by several contractors.

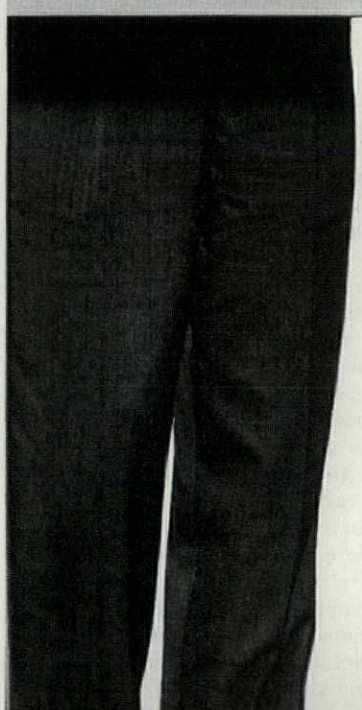
4. If a number of bids are required, the Purchase Requisition will eliminate radical bidding and the necessity of each bidder having to prepare a separate quantity analysis. Such duplication of effort is extremely wasteful because each analysis is limited to the use of

*Ec. D.; Fellow, Construction Surveyors Institute.

A.I.A. FILE NO. 26-A-9



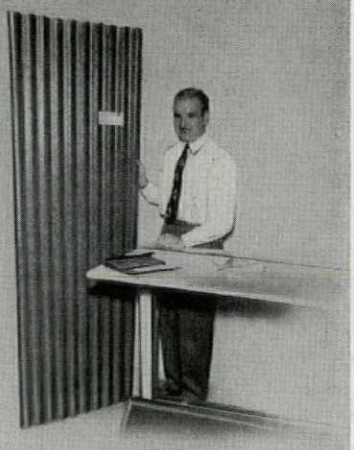
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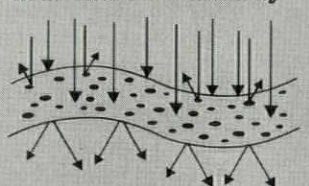
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Cost Control Assays and Estimates

one bidder only. Inasmuch as there are variations and inaccuracies in each bidder's quantity and quality analysis of requirements, the resulting quotations are not comparable. This form of competition is unfair and ineffective because it is not limited to price variations only, but rather to differences in quantity and quality.

5. When a Purchase Requisition with quantity analysis is provided, it is very useful for verifying contractors' payment requisitions and serves as basis for making plus and minus adjustments readily before and after contracts are awarded and projects completed. The cost of construction can be kept under control from the start of design to the completion of project through cooperation with the surveyor.

6. Should it be urgent to start construction operations before the working drawings and specifications are ready, a blanket Purchase Requisition without quantities may be issued for some or all items in advance to expedite earlier award of contracts and completion of the project. Before payment is made the quantity and quality of work completed and in place is verified by the surveyor.

7. The use of Purchase Requisitions will assure an even flow of projects into the market, thus stabilizing employment and prices. It also provides a permanent record for revaluation purposes. Such records are often impossible to reproduce accurately when the plans and specifications are lost.

The fee of a professional construction surveyor as a consultant on any project is only a fraction of the amount now wasted on needless and useless drafting, specifying, estimating, bidding, and accounting. A schedule of fee rates and sum charges will be quoted in advance by any surveyor according to scope and type of survey required.

Further suggestions for securing better cooperation within the industry to eliminate waste and provide more economical construction were developed through a poll of architects, engineers, and contractors throughout the United States, conducted recently by the Construction Surveyors Institute. The compilation of replies resulting from that referendum indicates that:

1. Nearly all responding were in favor of having basic drawings and specifications fully completed before issuance to the bidders.

2. Most bidders are opposed to the issuance of revised drawings and addenda for modifying or correcting the documents during the bidding period.

3. Contractors generally are in favor of holding alternate bids to a minimum in order to avoid wasting the client's money and the bidders' time. When alternate bids are warranted, they should be additions rather than deductions to the base bid for securing economical results.

4. Most general contractors are opposed to separation of bids and contracts on general construction, intermediate subcontracts, and mechanical trades on either public or private projects. Some do not object if they are properly compensated for the co-ordination of all contracts. Subcontractors, however, favor the separation of their work from the general contract.

5. Bidders are in favor of pre-established due dates and open reading of competitive bids on public and private projects.

6. Contractors prefer not to submit bids directly on, before, or after a holiday for lack of sub-prices. Often receipt of sub-bids by next mail may result in a saving of several thousand dollars to the construction buyer.

7. Nearly all contractors prefer bidding on definitely indicated pre-established quantities of work. Contractors should not be asked to assume responsibility for rock excavation and other risky soil conditions without borings and specific quantity analysis, although they may not favor bidding on unit price contracts generally. Where a Purchase Requisition is issued indicating pre-established quantities of work, it need not be awarded as a unit price contract unless doing so is mutually acceptable.

8. Most contractors favor bonds in lieu of certified checks for guaranteeing their bid, if they must do so. An economical transaction should not require bonding of any sort. To hold a bidder knowingly in error is to invite trouble and create waste.

9. Bidders and others instrumental in preparing quotations do not favor paying for bidding documents when their own services are rendered free of charge to prospective buyers.

10. Contractors and subcontractors are opposed to preparing or providing preliminary and budget estimates without compensation. Paying directly for reliable and useful information is more economical.

11. About fifty percent of the architects and contractors were in favor of using a professional quantity analysis as a Purchase Requisition for the basis of bids and contracts.

12. Many architects and contractors favor the awarding of a negotiated contract to a qualified selected builder on the basis of a quantity analysis and appraisal prepared or verified by a professional construction surveyor.

13. All branches of the industry favor the establishment of uniform terminology and methods in the preparation of estimates, quantity analyses, appraisals, and Purchase Requisitions.

14. Architects, surveyors, and contractors favor payment for professional surveys directly by the construction buyer rather than as a part of the architect's or designer's fee, or prorating the charge amongst bidders.

15. It is generally favored that quantity or construction surveyors, analysts, estimators, architects, engineers, and others *who prepare* Assays, Quantity Analyses, Appraisals, and Purchase Requisitions should publicly register or advertise their professional qualifications and services openly.

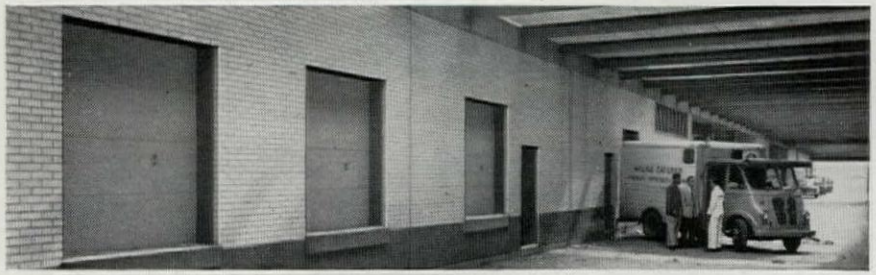
Application of the economic methods and practices advocated herein will conserve billions of dollars now wasted. The construction industry is too gigantic to be halted by traditional practices, especially those which are found to be inefficient and uneconomical. Many progressive architects, engineers, designers, contractors, and subcontractors have been steadily increasing their utilization of surveys for the past forty years. However, the demand for construction surveys of all types has increased about tenfold since 1945. Architects are the fastest growing users of professional surveys, for assaying, estimating, analyzing, appraising, and attesting construction costs and verifying, requisitioning, auditing, and supervising bids and contracts.

It is undeniable that the construction industry is becoming more conscious of rapidly rising costs. Architects, in particular, are at present over-designing and demanding an excessive amount of estimating to be done by contractors, which indicates that they are cost-conscious to a fault. It appears that in the utilization of any service or product, there first develops misuses and abuses before normal utilization takes place. The increasing use of professional surveys generally, indicates a trend toward greater economy and progress with more stability for the construction industry in the years ahead.



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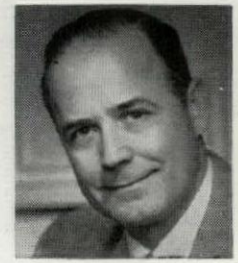
Architect and Engineer
Hellmuth, Yamasaki & Leinweber, Architects
Detroit, St. Louis

Structural Engineer
William C. Becker, St. Louis

Mechanical Engineer
Ferris & Hamig, St. Louis

Contractors
L & R Construction Company, St. Louis

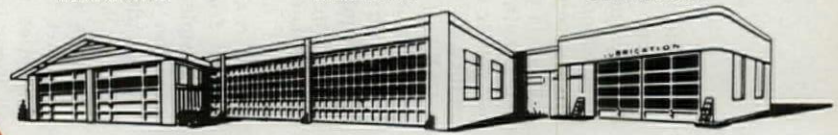
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AIA Office Practice Committee Replies

Dear Editor: I think PROGRESSIVE ARCHITECTURE has been very wise in selecting Bernard Tomson to write articles with reference to the legal aspects and contract documents of the Architectural profession. (*See* IT'S THE LAW *in September, October, and November 1956 P/A.*) He is a man who has devoted a lot of study to his subject and I have thoroughly enjoyed his articles and also his talks. We were fortunate to have him one time as principal speaker for the Georgia Chapter of the AIA. His articles have been studied by various members of the Office Practice Committee and his points of view have had their influence and many members find them provocative of thought.

As a member of the AIA Office Practice Committee, I am hesitant to write in detail about each of his proposals, for in some instances my thinking is not the same as the majority of the Committee on Office Practice. I appreciate the articles presenting the work that the Office Practice Committee is doing in a favorable light, and I hope that you will be able to do likewise in the future. The AIA documents are very important and are used extensively; they deserve continuous study and articles concerning them such as you are presenting.

H. GRIFFITH EDWARDS
Edwards & Portman
Atlanta, Ga.

•

Dear Editor: I have read Bernard Tomson's articles and feel that his writings are always pertinent to the issue and express an objective point of view. His statements are positive, even though they may tend to oversimplify some of the problems at times, and should be read with interest by everyone concerned with Office Practice documents.

DANIEL SCHWARTZMAN
New York, N. Y.

•

Dear Editor: I readily bow to professional superiority in Bernard Tomson's legal appraisal of what our committee is attempting, and I congratulate and thank him and P/A for the very fine service his column is to our own profession.

However, there are many ways of skinning a cat (which I have never done), and Tomson's natural resistance to contract forms has apparently led him to suggest only a *different* form, where he realizes a form to be inevitable. That the form suggested appears to be logical, simple, and to the point should not lead to the assumption that it is a *better* form. Concern (and "pessimism") over protection of pocketbooks by architects has caused Tomson to omit from his printed portion all detail of the architect's duties, except for supervision. Possibly, Tomson expects that an individual architect will put himself as far in this direction as he may wish by outlining the project description and service to be performed, which are expressly inserted in each contract. This is almost the handling of the presently used A-102 and B-102, which is perhaps no criticism of Tomson's proposal, but which contributes mightily to its simplicity.

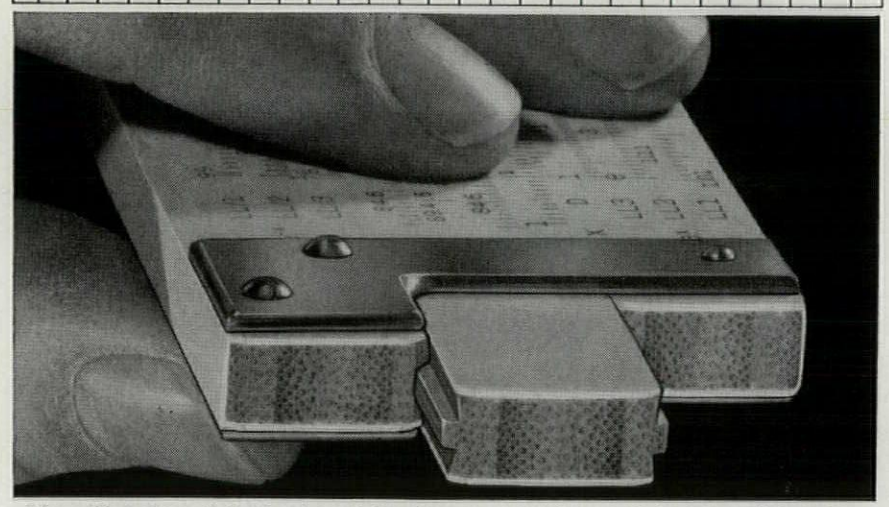
I believe one of the prime objections to the presently used form is its unilateral nature, in which the Client is carefully pinned down, the Architect left free as the breezes to

(Continued on page 14)

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DRAFTING TRENDS



Magnified view of the laminated bamboo construction used in Post slide rules.

Why the trend to bamboo construction?

Due to its unique characteristics, bamboo is an especially suitable base material for various unusual applications. For example, experience over many years has proven bamboo's properties are ideal for slide rule construction. Here are some of the most outstanding reasons why the growing trend is to bamboo rules:

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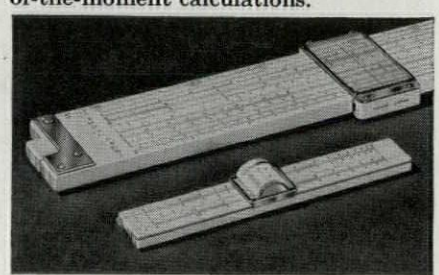
Recognizing the advantage of bamboo, Post uses it exclusively for slide rule construction. To the basic advantages of bamboo, Post has added several other features that further improve slide rule accuracy and dependability. For example, graduations are "engine-divided." Every marking is cut into the snow white celluloid face with a machine controlled knife edge. "Engine-divided" scales are easy to read, unfailingly accurate and last the lifetime of the rule.

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(Top) *Post Versalog slide rule* (Bottom) *Post 1441 Vest Pocket slide rule*

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p/a views

(Continued from page 13)

perform whatever he interprets as a service. With admittedly no knowledge of the legal consequences (for which we depend upon Institute counsel), I believe the stature of an individual architect, and of the profession as a whole, will increase by a show of responsibility in our contracts. I am also certain that quality of our work will improve if each of us has impressed upon him a certain normal standard below which no architect should operate. I grant to you that there should be better ways of impressing such standards than briefly in a contract, but you should know (through your editorial experience) as well as I (through my committee experience) that persons who read what is written are generally those who least need the knowledge gained thereby.

Tomson's proposal pins the Client even more firmly than the Committee's draft and here he may be right, legally. From the practical standpoint, the Architect must still get a Client's signature to implement these various contract proposals. First we find him, salt his tail, pin him, then we sprinkle him with formaldehyde by not stipulating much that we expect to do: can we anticipate his agreeable co-operation?

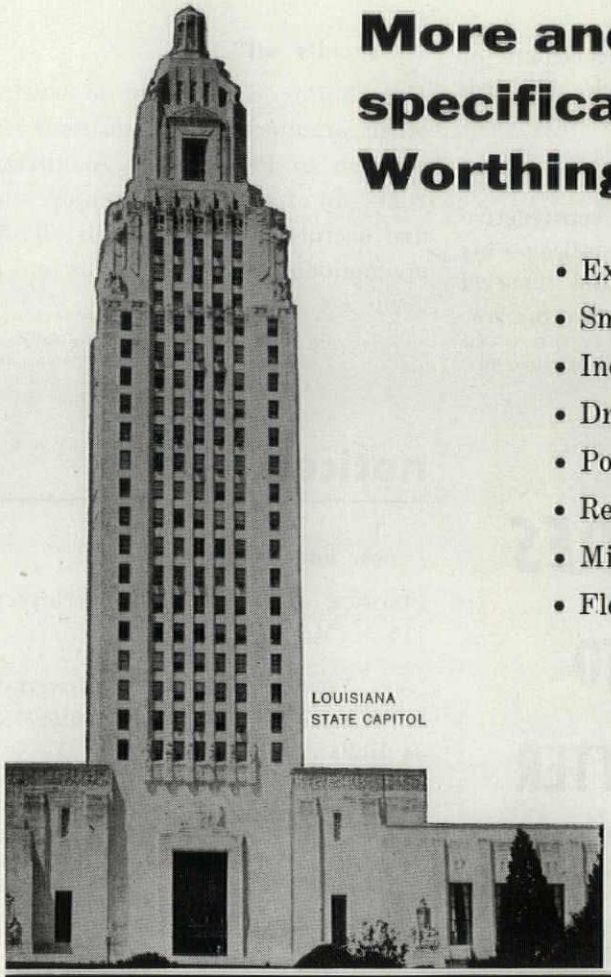
Except for the above, I feel that Tomson's draft is basically good; a few points of detail naturally differ from the Committee's thinking. His suggestions as to form are interesting, but I would guess that should the changes necessary to meet my views be made, the form would be quite different, and that it would lose much of its attractive simplicity.

These comments should of course be taken as only one man's opinion of this series in Tomson's column. I welcome his critical analysis of Institute work, and of the legal shortcomings of architects generally. May he never tire of us!

NELSON SMITH
Birmingham, Ala.

(Continued on page 16)

More and more air conditioning specifications call for Worthington Induction Systems



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Architect: Hazen & Robinson, Lincoln, Neb.
Contractor: Ray Martin Co., Lincoln, Neb.

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Contractor: C. Wallace Plumbing Co., Houston, Texas

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Contractor: Alvord & Swift, New York, N. Y.

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Engineer: De Laureal & Moses, New Orleans, La.
Architect: Dreyfus, Seiferth & Gibert, New Orleans, La.
Contractor: James F. O'Neil, New Orleans, La.

BANK OF NEW YORK NEW YORK, N. Y.
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p/a views

(Continued from page 14)

Dear Editor: As Chairman of the Committee on Office Practice of The American Institute of Architects, responsible for the study of the client-architect relationship and the development of such forms, I do not think that I have any specific comment to make about the content of Bernard Tomson's articles concerning the Client-Architect Agreement form.

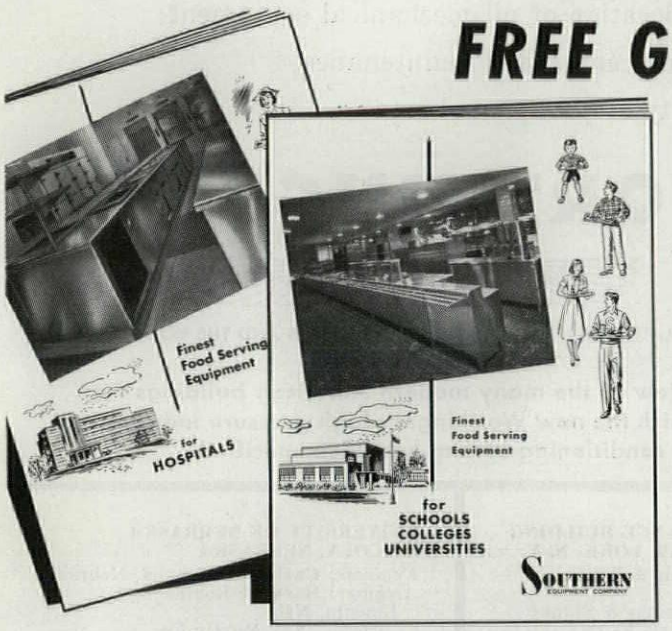
I will say that I believe such expressions can serve a constructive purpose and I, for one, welcome his comment concerning the general problem of the architect and the law.

DAVID C. BAER
Houston, Tex.

"excells all"

Dear Editor: I subscribe to several other architectural publications in addition to PROGRESSIVE ARCHITECTURE—all of which I read, enjoy, and find useful—but P/A excells all, in my opinion. Congratulations on a good job.

THOMAS M. GLASGOW
Uniontown, Pa.



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NEW YORK STATE JOINT HOSPITAL SURVEY AND PLANNING COMMISSION, 84 Holland Ave., Albany, N. Y.

NORMAN C. RUSSELL, Architect, 440 Stafford St., Winnipeg 9, Manitoba, Canada.

JULES SALKIN, Architect, 251 S. Robertson Blvd., Beverly Hills, Calif.

HUGH STUBBINS & ASSOCIATES, Architects, 806 Massachusetts Ave., Cambridge, Mass.

WILLIAM E. BRACKETT, JR., Architect, 6 Hunter Bldg., Hendersonville, N. C.

MILTON GLASER ASSOCIATES, Interior Decorators, 210 E. Franklin St., Richmond, Va.

THOMAS G. LO MEDICO, Sculptor, 128 Main St., Tappan, N. Y.

new offices, partnerships

LAPORTE & PENN, Consultant Civil and Structural Engineers, 1470 Holden Ave., Detroit 2, Mich.

DARREL D. RIPPETEAU and SARKIS M. ARKELL, Architects, have become partners in firm of SARGENT-WEBSTER-CRENSHAW & FOLLEY, Schenectady, N. Y.

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Mr. Gerholz (left) at the site of his Westgate Park community in Flint, Michigan. With him is Edward Rozsypal of Michigan Bell Telephone Company.

"Concealed telephone wiring is a 'must' for modern homes"

—says Mr. Robert P. Gerholz of Gerholz Community Homes, Inc., Flint, Michigan

"We're building 800 homes in our Westgate Park community," says Mr. Gerholz, "and in each of them we're providing several telephone outlets.

"In my opinion, concealed telephone wiring is a sign of a well-integrated, preplanned home. Home buyers are learning to ask for it, progressive builders are providing it. I think it will soon be difficult for any builder to sell a home that doesn't have concealed telephone wiring. It's a 'must' for modern homes."

Mr. Gerholz is the only man ever to have been President of both NAHB (1944) and NAREB (1950). In his 35 years as a builder he has built over 4200 homes. His Westgate Park community of homes in Flint, Michigan, has twice received the NAHB's Award of Merit, in 1954 and again in 1955. Like many other trend-minded builders across the nation, Mr. Gerholz knows the value of concealed telephone wiring as a modern sales feature.

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Your nearest Bell Telephone business office will help you with concealed wiring plans. For details on home telephone wiring, see Sweet's Light Construction File, 8i/Be. For commercial installations, Sweet's Architectural File, 32a/Be.

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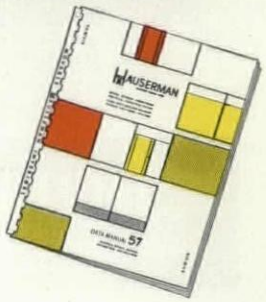
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CLASSROOM-LABORATORY BUILDING, NORTHEASTERN UNIVERSITY, BOSTON, MASS.

Architect: Shepley, Bulfinch, Richardson & Abbott *Contractor: John A. Volpe Construction Co., Inc*

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were chosen for this classroom-laboratory building at Northeastern University in Boston, Mass. It contains 110,000 square feet of floor space and incorporates 42 classrooms, 8 laboratories, 12 offices and 5 conference rooms. Hope's Steel Windows were used to form vertical glass bays extending from the first floor to the top. Awning type ventilators provide comfortable and healthful air circulation while providing maximum protection from inclement weather. Abundant natural light is admitted making all working areas cheerful and restful.

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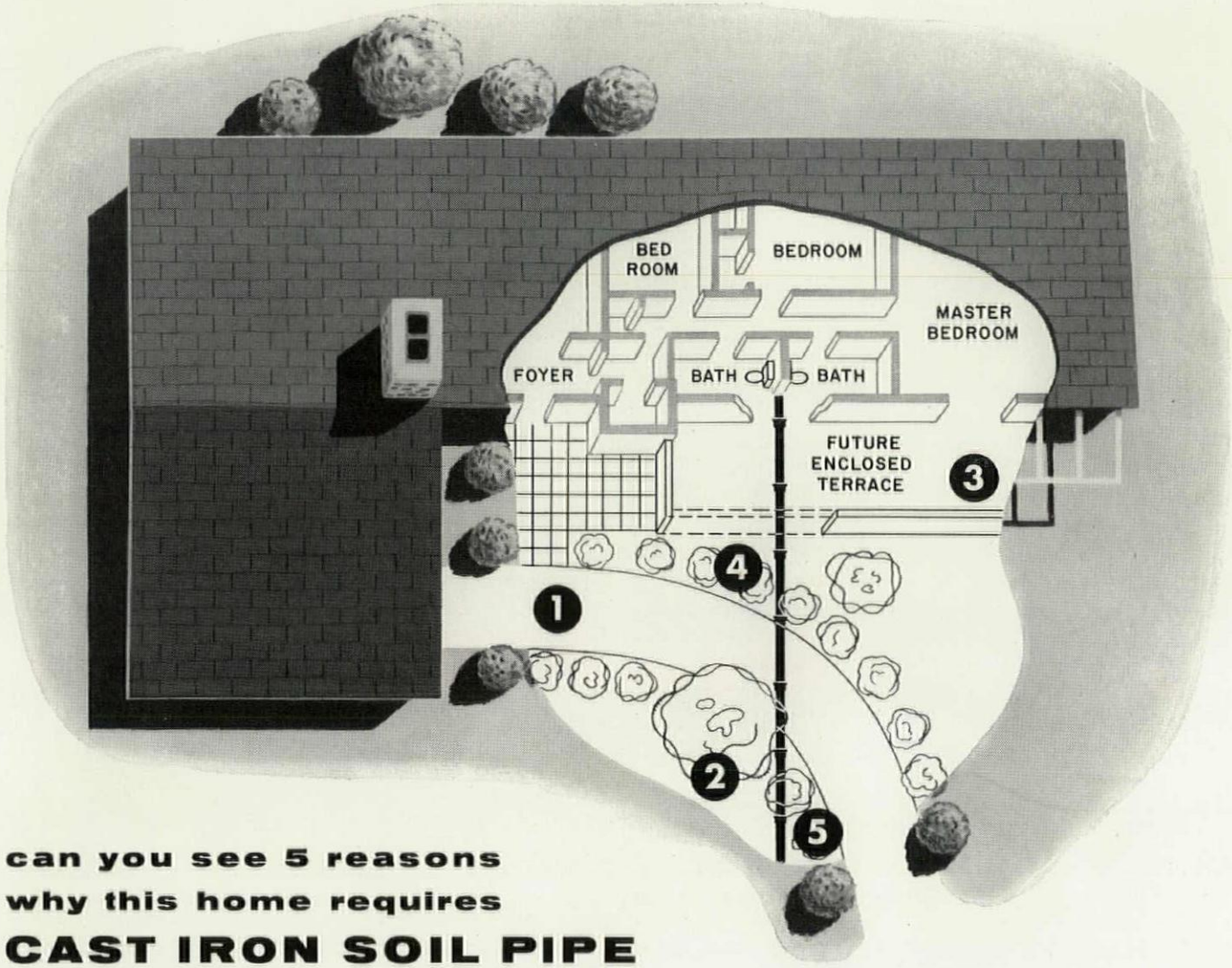
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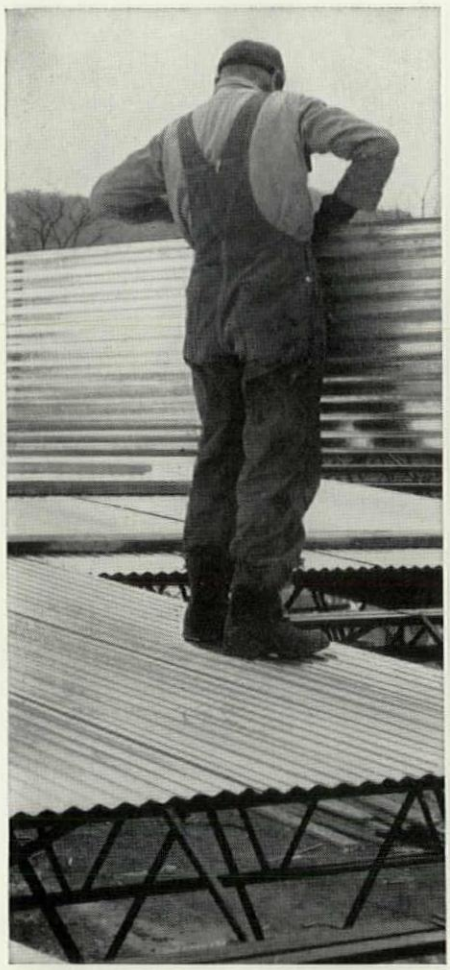
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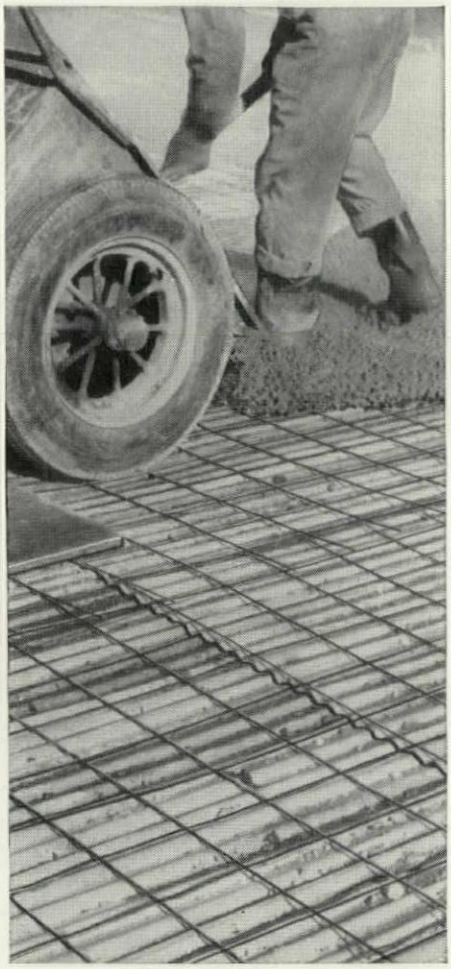
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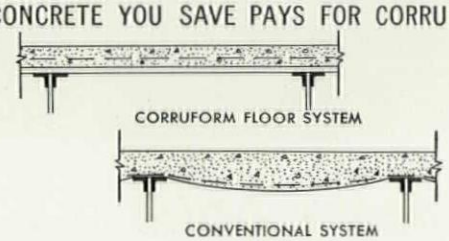


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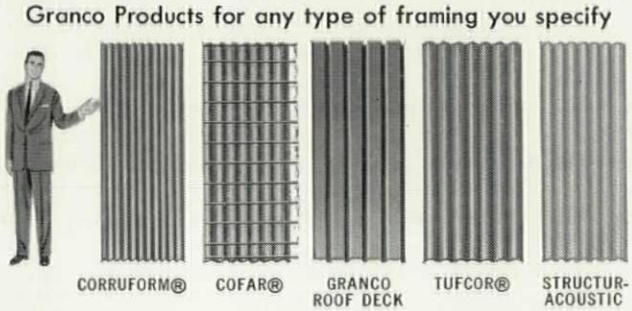
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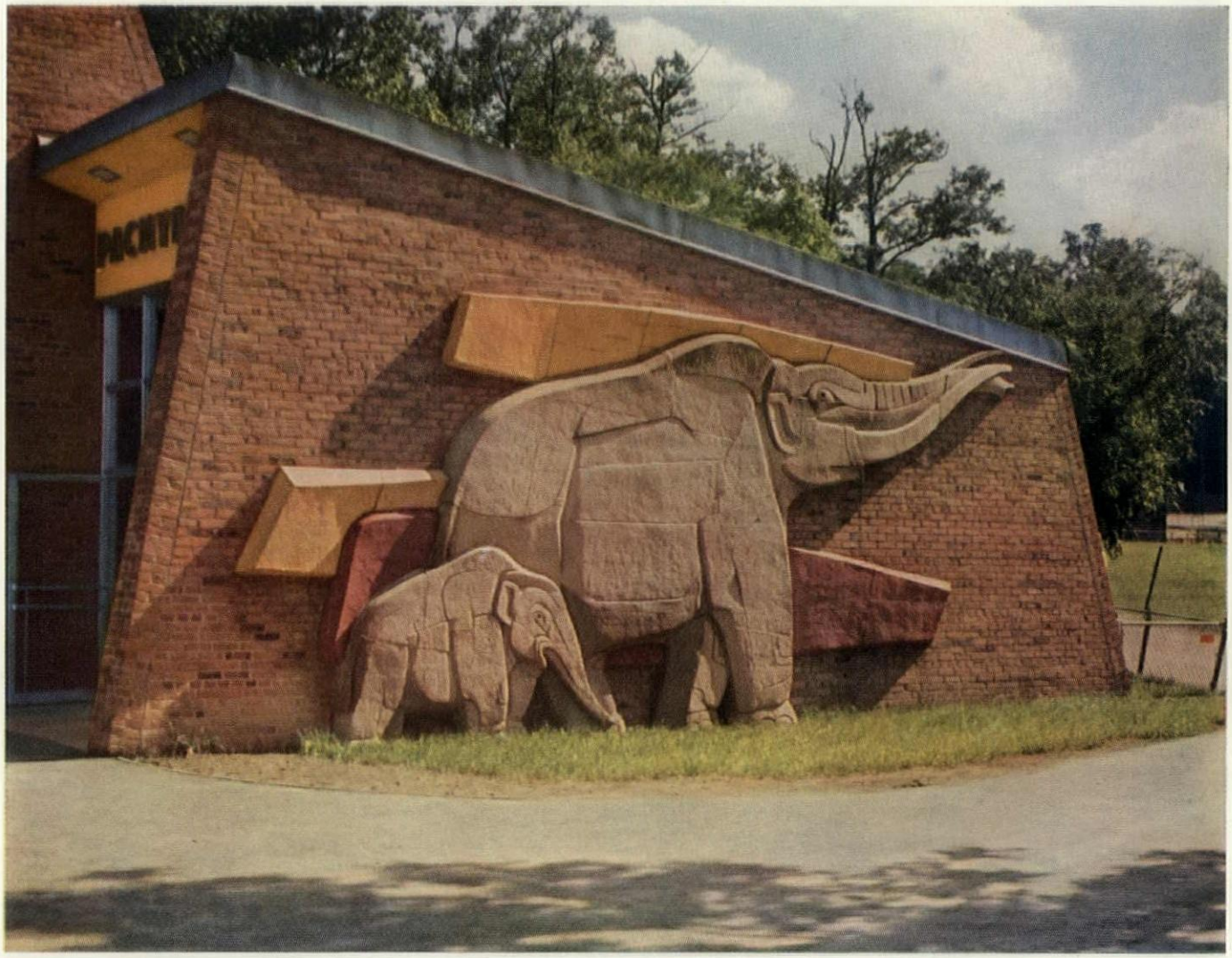
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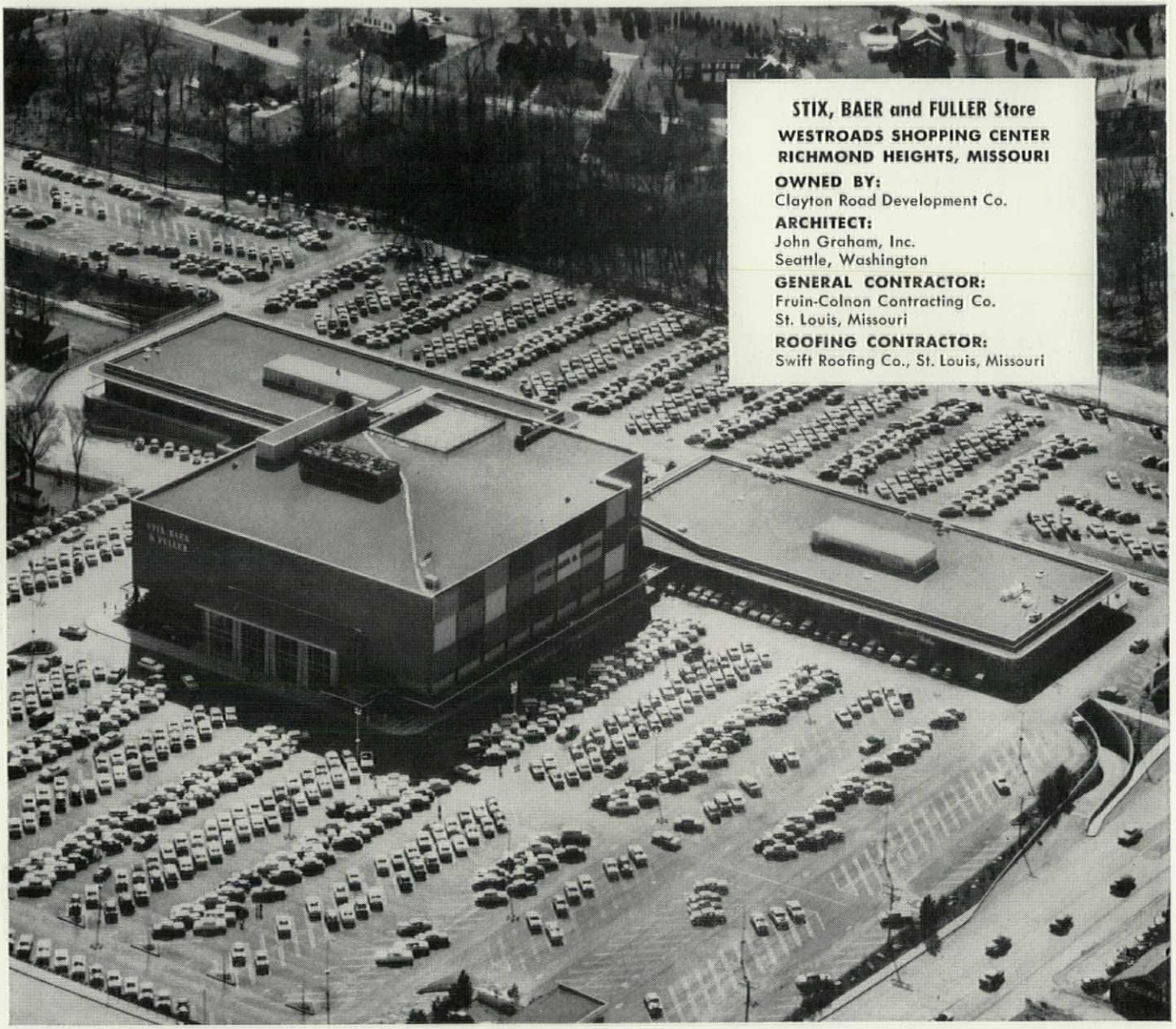
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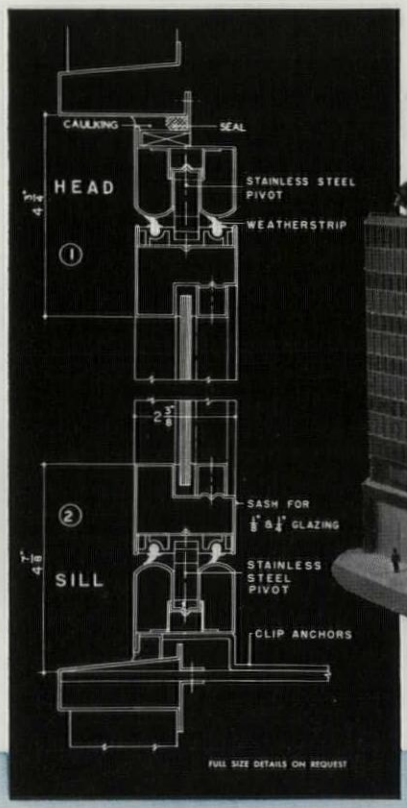
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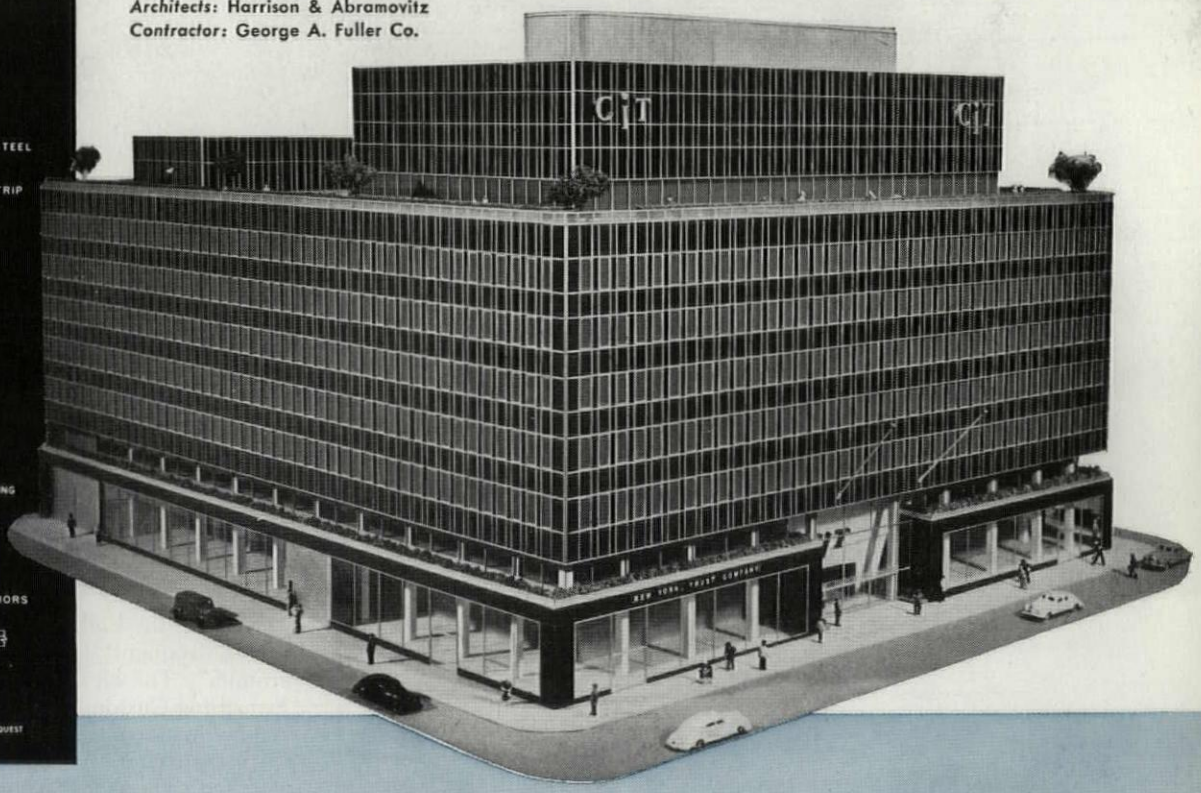
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the flooring spec: Armstrong Custom Corlon Tile

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interior design: Leigh Allen, Designer — J. Gordon Carr





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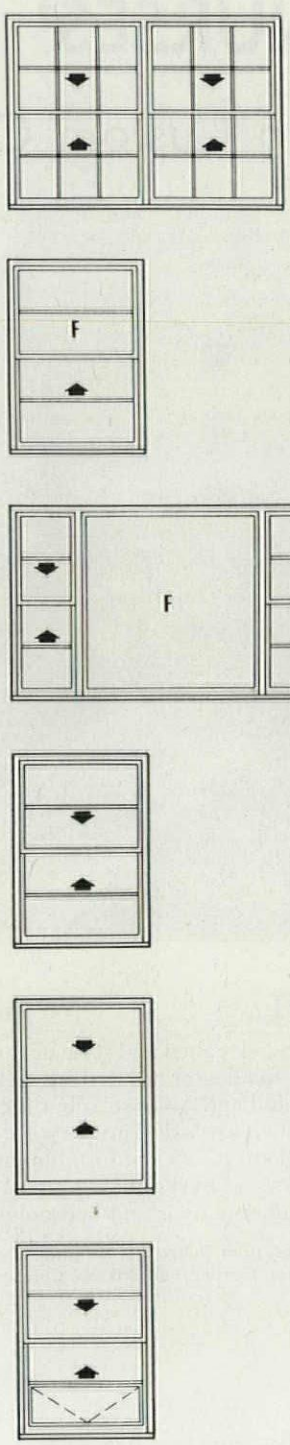
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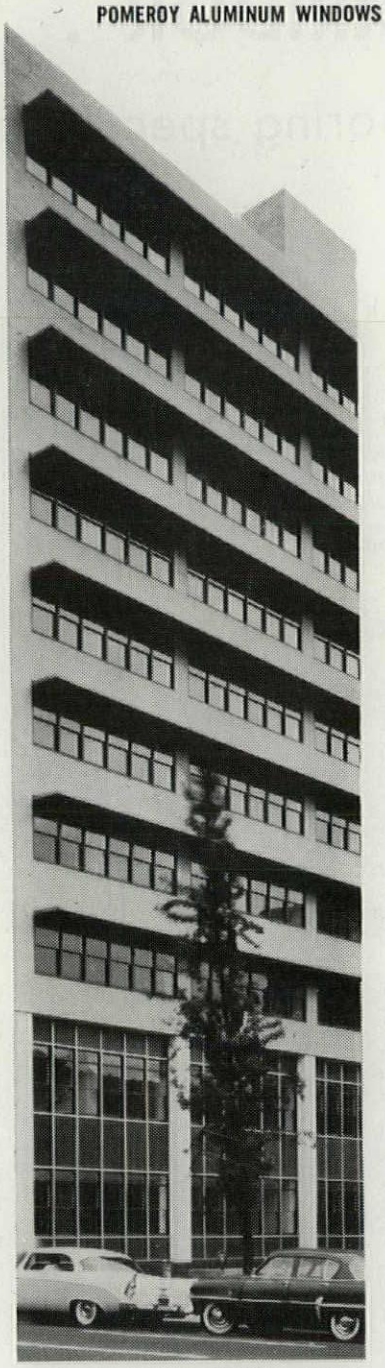
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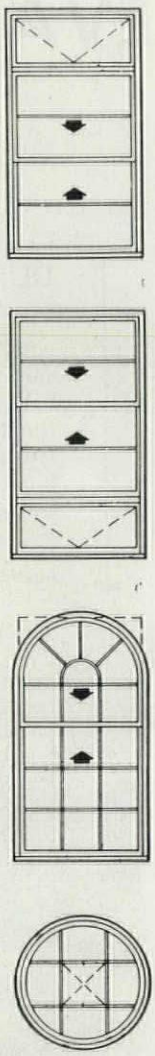
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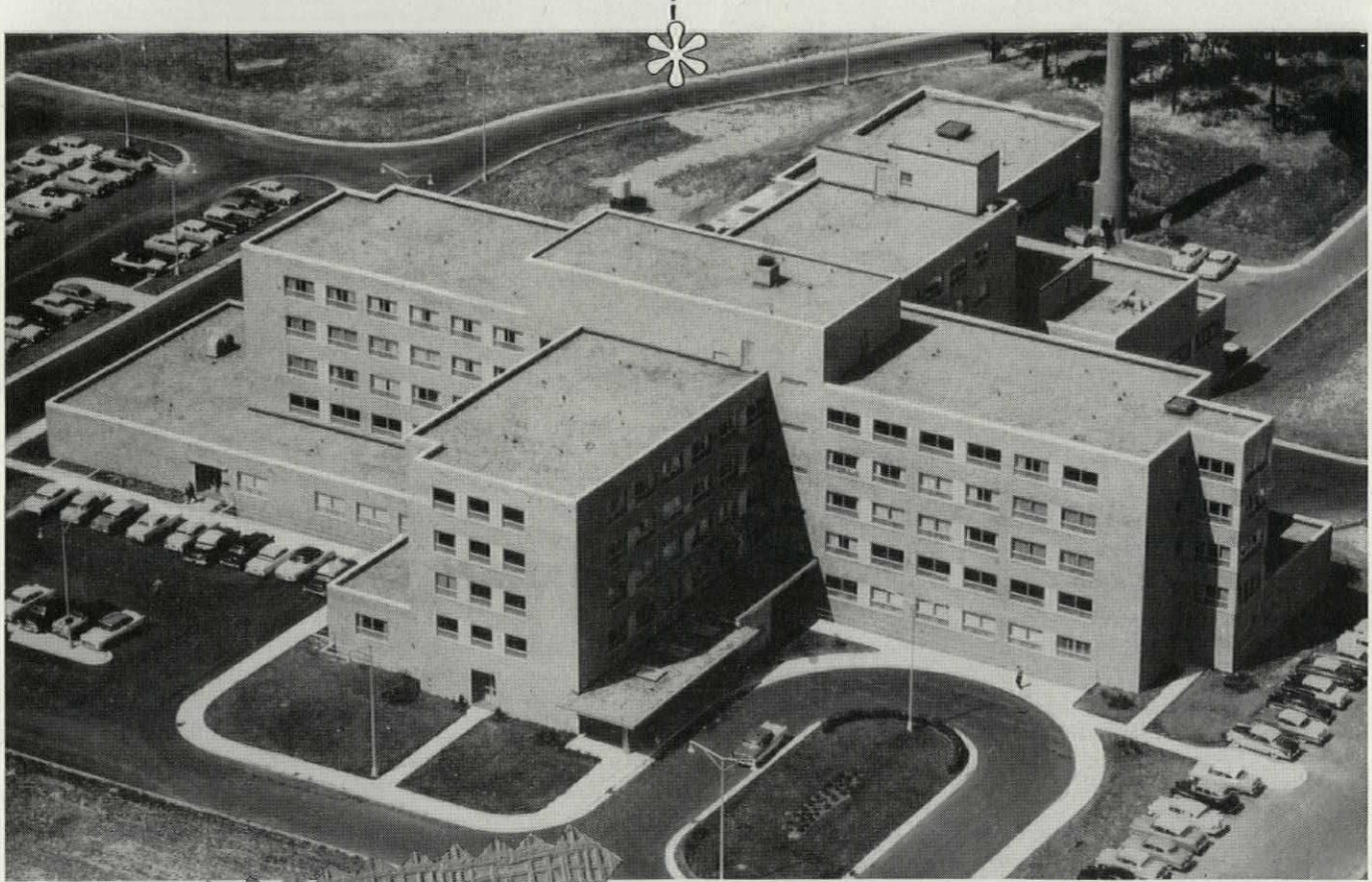
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Again . . . and again . . .
the best designed buildings
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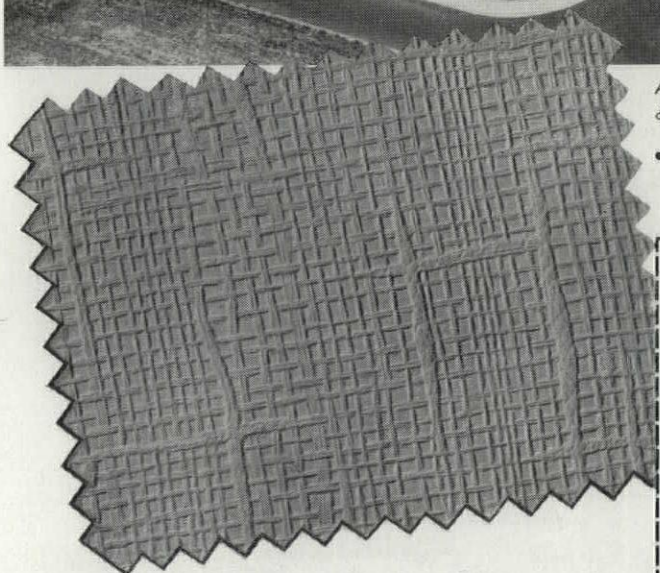
Joanna *Vinyl* Wall Fabric

"Why, this hospital is beautiful!" This public tribute to modern hospital interior design was heard repeatedly—on "opening day" of the new 1500 bed Indianapolis Community Hospital. Enthusiastic response was merited by the fine techniques and materials used . . . including, of course, Joanna Vinyl Wall Fabrics for the interior walls.

Learn for yourself why Joanna Vinyl Wall Fabric is the choice for America's best designed buildings . . . again and again. Write for samples and complete literature.



Aerial View of Indianapolis Community Hospital. Designed by Daggett, Naegele & Daggett, Inc., Indianapolis.



- New colors
- New styling
- Longer lasting
- Easier to install
- Easier to maintain

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Dept. 10B
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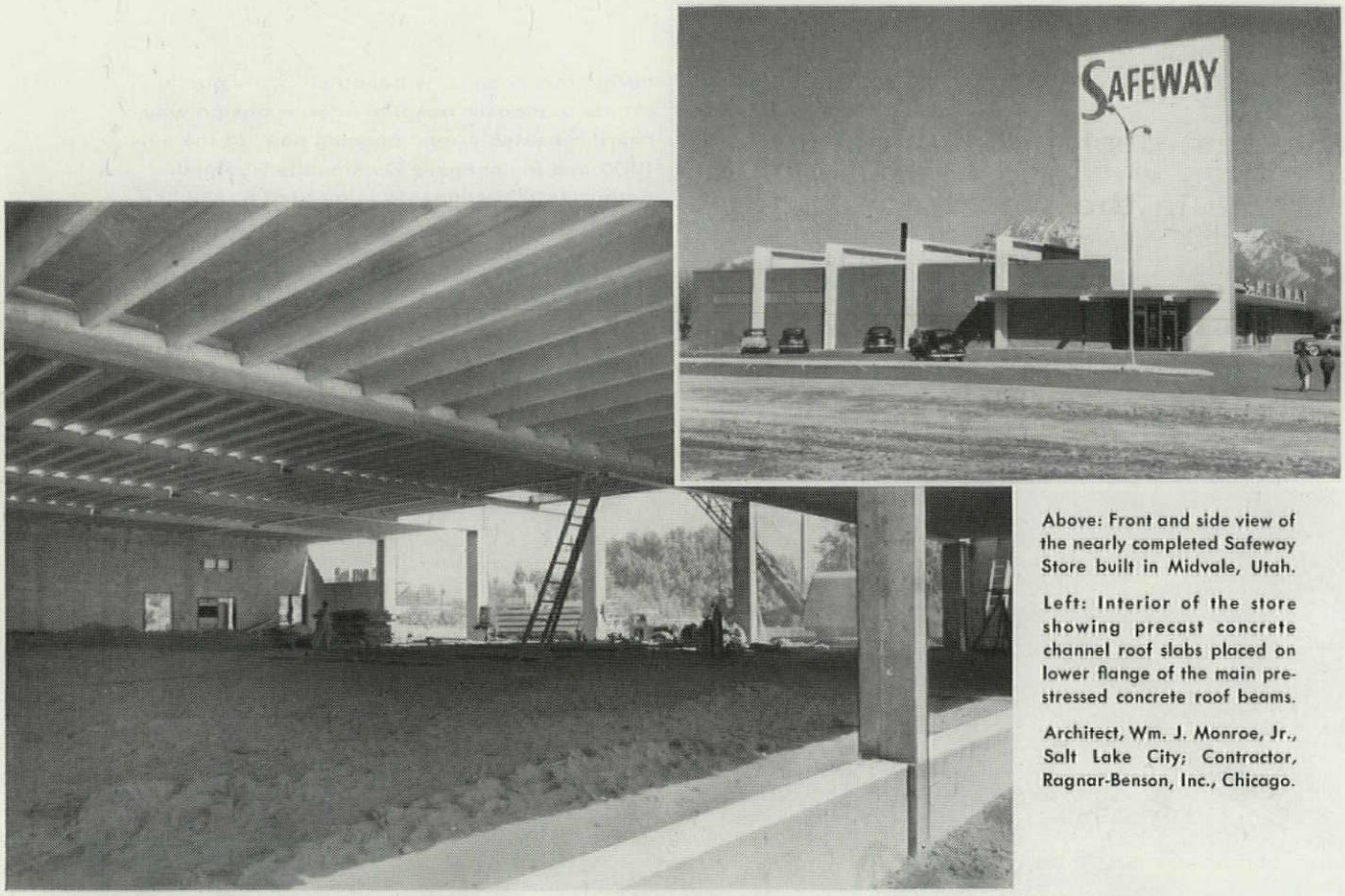
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Above: Front and side view of the nearly completed Safeway Store built in Midvale, Utah.

Left: Interior of the store showing precast concrete channel roof slabs placed on lower flange of the main prestressed concrete roof beams.

Architect, Wm. J. Monroe, Jr., Salt Lake City; Contractor, Ragnar-Benson, Inc., Chicago.

Super Mart's 108 ft. clear span made possible by Precast, Prestressed Concrete Beams

The Safeway Store Building in Midvale, Utah, obtained a clear floor area 108′ wide by 130′ deep through the use of only five precast, prestressed concrete beams. The beams, cast on the job site, were placed to give a 16′ space above the finished floor in the main store area.

The roof required about 13,500 sq. ft. of precast concrete channel slabs with conventional reinforcement. These channels, 2′ wide with 10″ legs, were placed on the lower flanges of the main prestressed beams. This allowed the prestressed concrete beams to stand boldly above the finished roof line to produce a dramatic architectural effect.

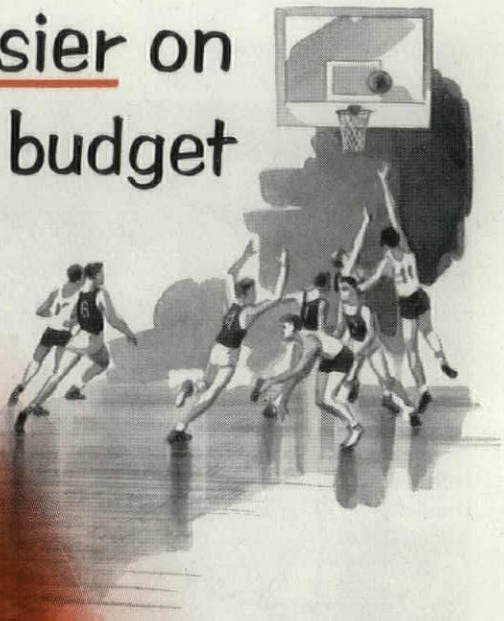
Structures designed to utilize precast and prestressed units can be built for any usage and to conform with any applicable local building codes. Like all concrete structures they offer many advantages: great strength, extra long life, very low maintenance cost and true *low-annual-cost* service. In addition, such structures provide great resistance to destructive natural forces such as storms, decay, termites and especially fire.

For additional information on construction utilizing precast and prestressed concrete beams write today for our helpful free illustrated literature. Distributed only in the United States and Canada.

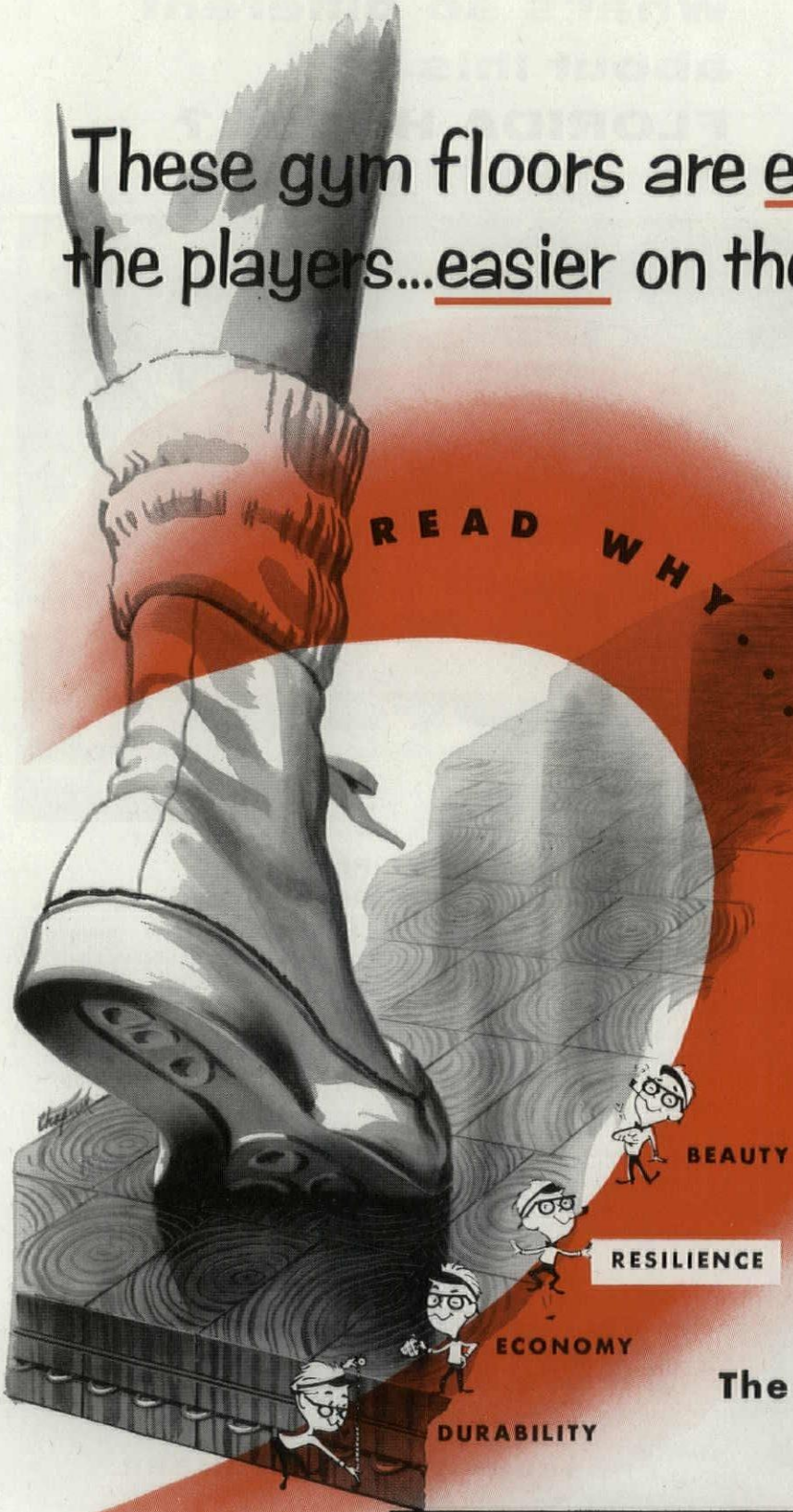
PORTLAND CEMENT ASSOCIATION
Dept. A2-25, 33 West Grand Avenue, Chicago 10, Illinois
A national organization to improve and extend the uses of portland cement and concrete . . . through scientific research and engineering field work



These gym floors are easier on the players...easier on the budget



READ WHY . . .



A combination of inherent characteristics gives Kreolite Flexible Strip End-Grain Wood Block Floors the exact features that make for better gym installations.

High resiliency reduces fatigue . . . splinter-proof . . . they are safer . . . easier on players, can take constant abuse.

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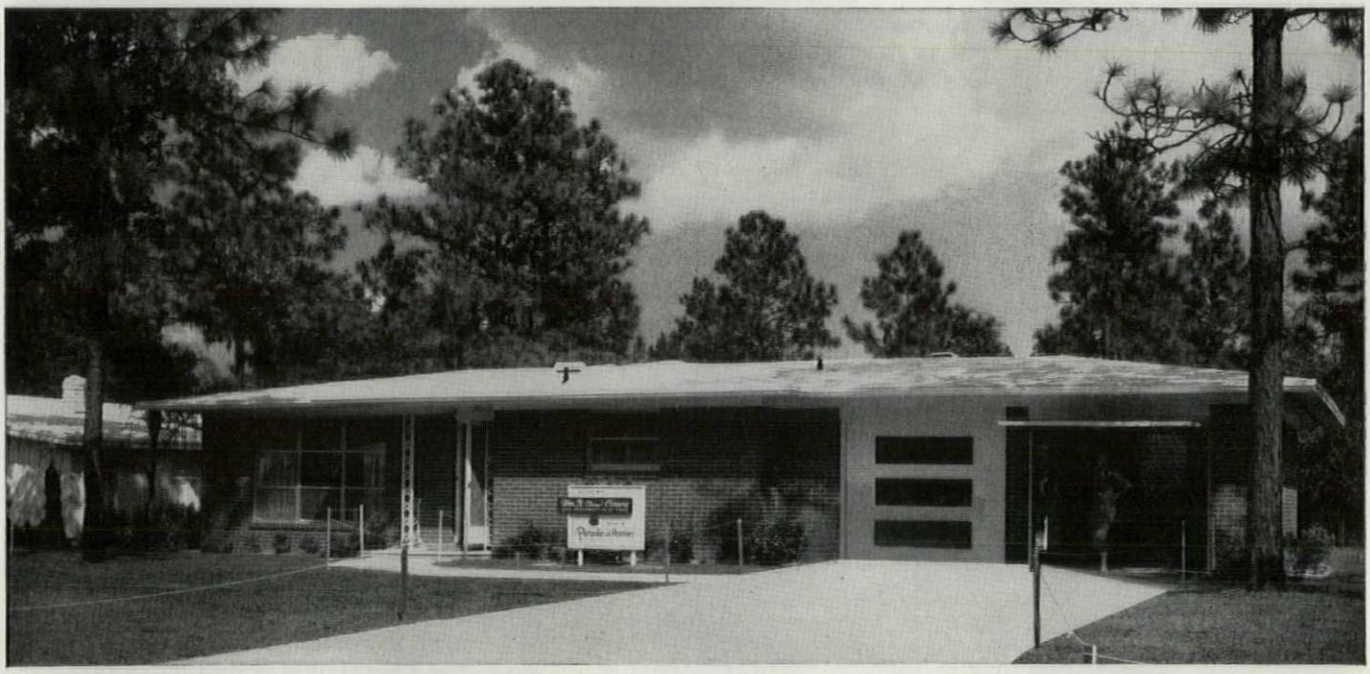
To keep your flooring budget in line, whether for gyms, multi-purpose rooms or shops, get all the facts on Kreolite's money saving advantages. Write today for complete specifications.

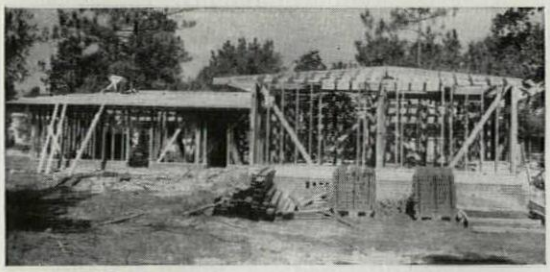
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KREOLITE FLEXIBLE STRIP **END GRAIN**
WOOD BLOCK FLOORS

What's so different about this FLORIDA HOUSE?

Architect: William G. Connors



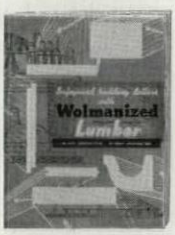


From sill to ridgeboard, every piece of lumber in this Jacksonville residence is Wolmanized pressure-treated lumber. Future savings in just one repair job caused by decay or termites will more than pay for the moderate additional cost of specifying Wolmanized lumber throughout the house.

It Has Built-in, Lifetime Protection Against Termite and Decay Damage!

Careful planning in this house has eliminated future maintenance costs due to subterranean termite damage and decay. That is because the architect specified that all the lumber for the house be *pressure-treated* with Wolman® salts. Wolmanized® lumber was used because it has all these desirable properties: It resists rot and termites. It is clean, paintable, odorless. It is fiber-fixed, non-corrosive to imbedded metal fasteners, and glueable even with the newer resins.

Wolmanized lumber offers unlimited application possibilities; it serves better and longer—yet, it's economical to use, adding about 1½ per cent to total costs. Read how you can safeguard building dollars with Wolmanized pressure-treated lumber in the light and heavy structures you design.



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This handbook tells the complete story. The how and why of Wolmanized lumber and many suggestions for residential, commercial, industrial and institutional applications are covered in this 16-page handbook. Write for your copy.

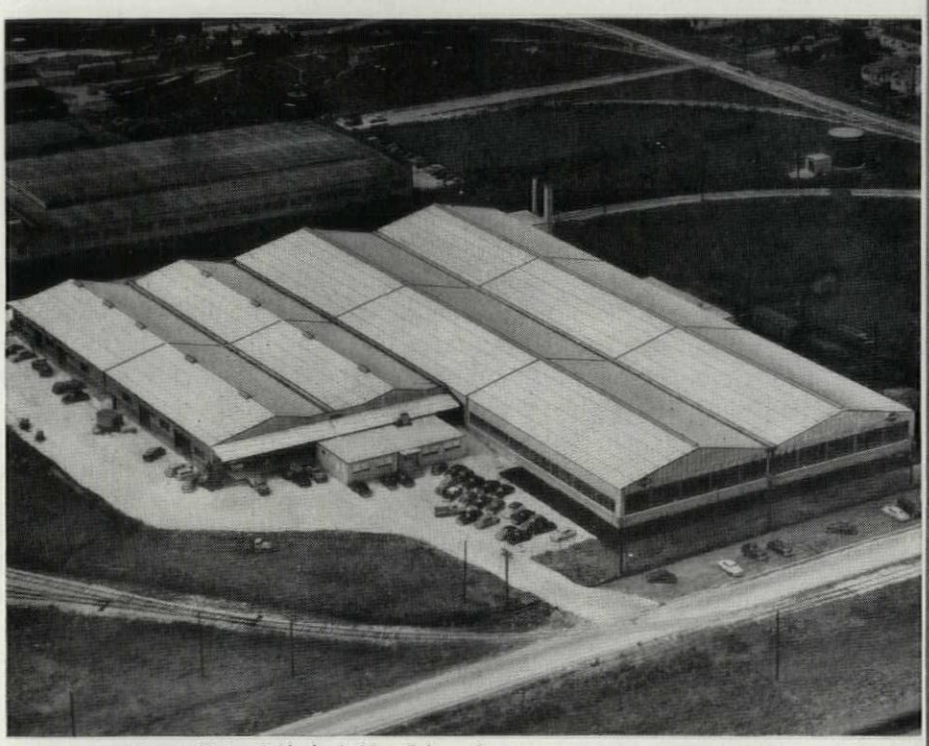
W-4

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1452 KOPPERS BUILDING · PITTSBURGH 19, PA.

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Gold Bond Applicator: Taylor Seidenbach, New Orleans, La.

Gold Bond Corrugated Asbestone "400" actually grows stronger with age

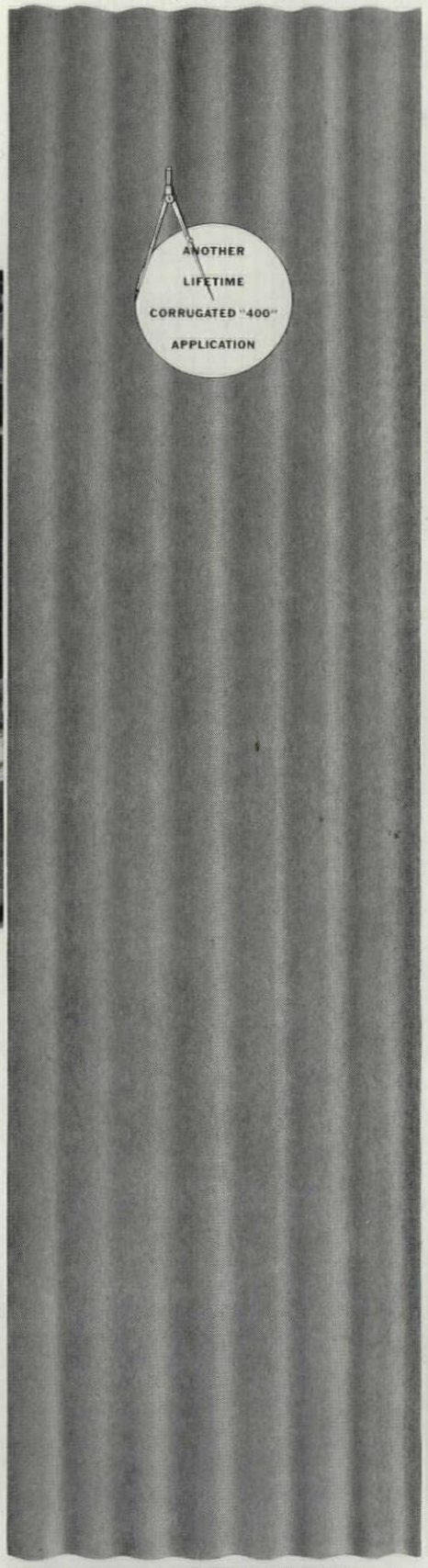


"We looked ahead when we roofed and sided our New Orleans plant," say J. F. Kirkpatrick, vice-president and plant manager of the Edwin H. Fitler Co., manufacturers of manila rope and sisal twine.

"The 200,000 square feet of Gold Bond Corrugated '400' in the roof and sidewalls are built to last—and we save a considerable amount of money each year on maintenance costs."

Corrugated Asbestone *permanently resists fire, weather, corrosion*—and helps to keep temperatures cool on the hottest days.

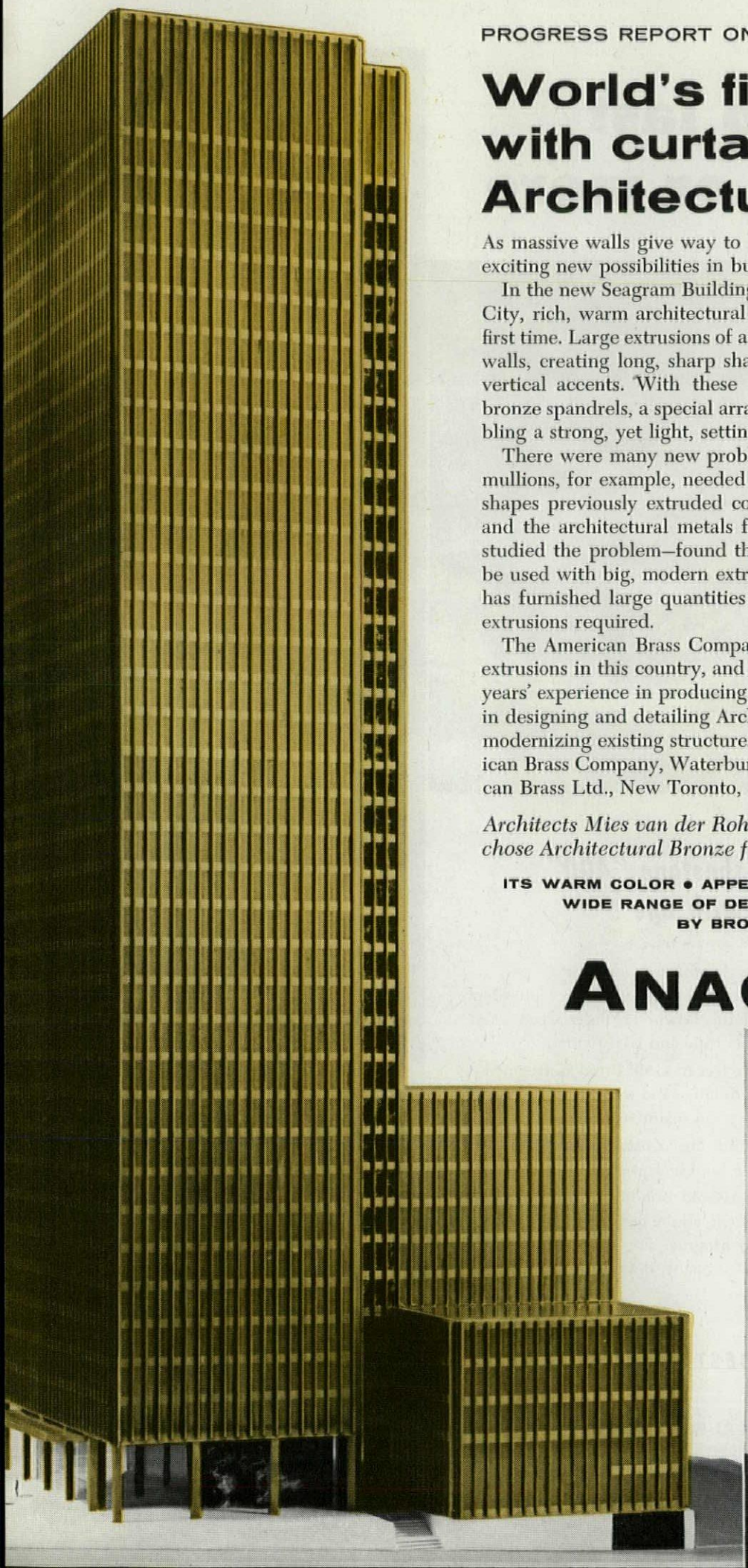
Does the Fitler "400" Story suggest a Gold Bond® Corrugated Asbestone use to you? Wherever you use it, you're getting strength and good looks for a lengthy lifetime. For further details, write Dept. PA-27, National Gypsum Company, P. O. Box 5257-B, New Orleans 15, La.



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Gold Bond
BUILDING PRODUCTS



PROGRESS REPORT ON THE

World's first building with curtain walls of Architectural Bronze

As massive walls give way to lightweight "curtains" of glass and metal, exciting new possibilities in building design are being opened.

In the new Seagram Building now rising on Park Avenue in New York City, rich, warm architectural bronze is being used in this way for the first time. Large extrusions of architectural bronze will stand out from the walls, creating long, sharp shadows which will give the building crisp, vertical accents. With these and smaller extrusions and rolled sheet bronze spandrels, a special arrangement of parts was designed for assembling a strong, yet light, setting for the floor-to-ceiling windows.

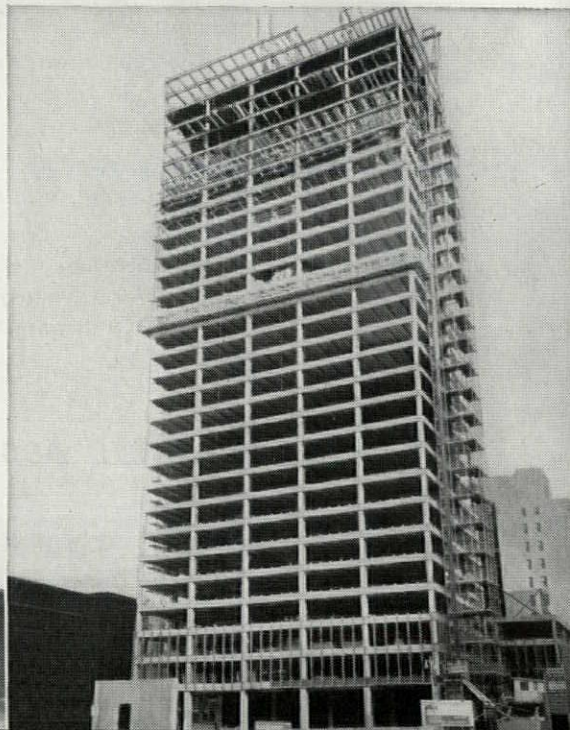
There were many new problems to face and overcome. The I-shaped mullions, for example, needed to be much larger than any architectural shapes previously extruded commercially. Working with the architects and the architectural metals fabricator, The American Brass Company studied the problem—found the answer with specially designed dies to be used with big, modern extrusion equipment. As principal supplier, it has furnished large quantities of the I-shaped mullion and many other extrusions required.

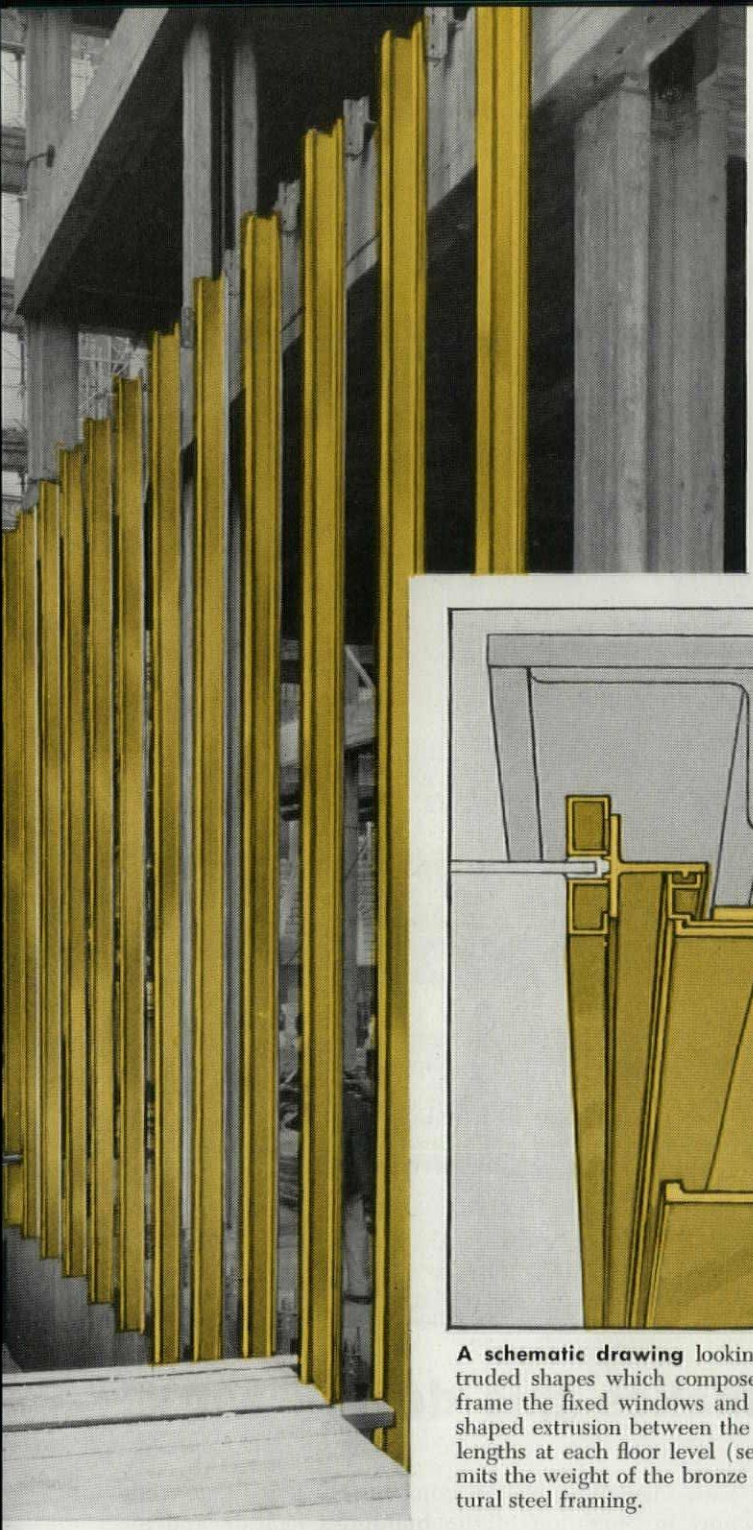
The American Brass Company pioneered the development of bronze extrusions in this country, and the knowledge gained from more than 50 years' experience in producing extruded shapes is available to assist you in designing and detailing Architectural Bronze for new buildings or for modernizing existing structures. For more information write: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont. 5650

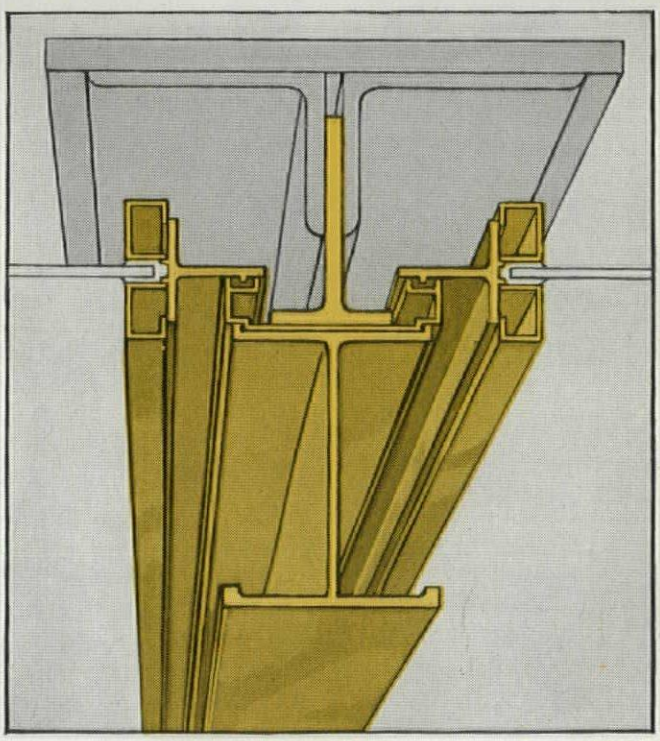
Architects Mies van der Rohe and Philip Johnson chose Architectural Bronze for:

ITS WARM COLOR • APPEARANCE THAT IMPROVES WITH AGE
WIDE RANGE OF DESIGN POSSIBILITIES OFFERED BY BRONZE EXTRUSIONS

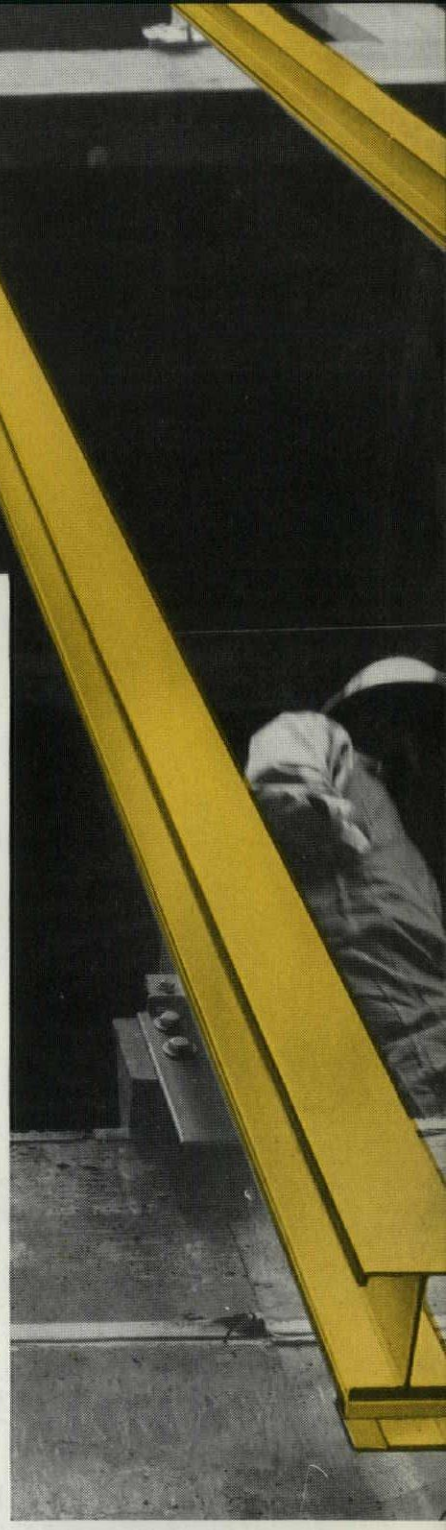
ANACONDA®







A schematic drawing looking down on the assembly of extruded shapes which compose the architectural mullions—and frame the fixed windows and bronze spandrels. The heavy T-shaped extrusion between the steel angles is used only in short lengths at each floor level (see photo, lower right) and transmits the weight of the bronze facing and windows to the structural steel framing.

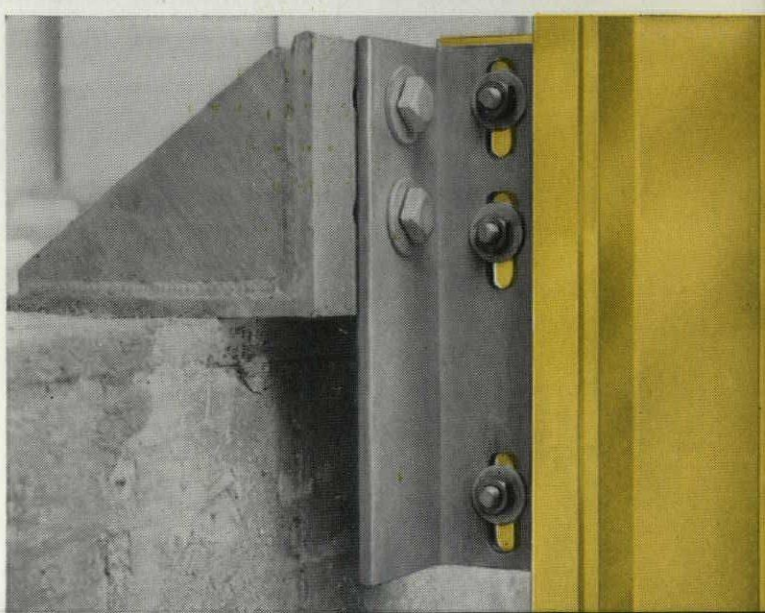


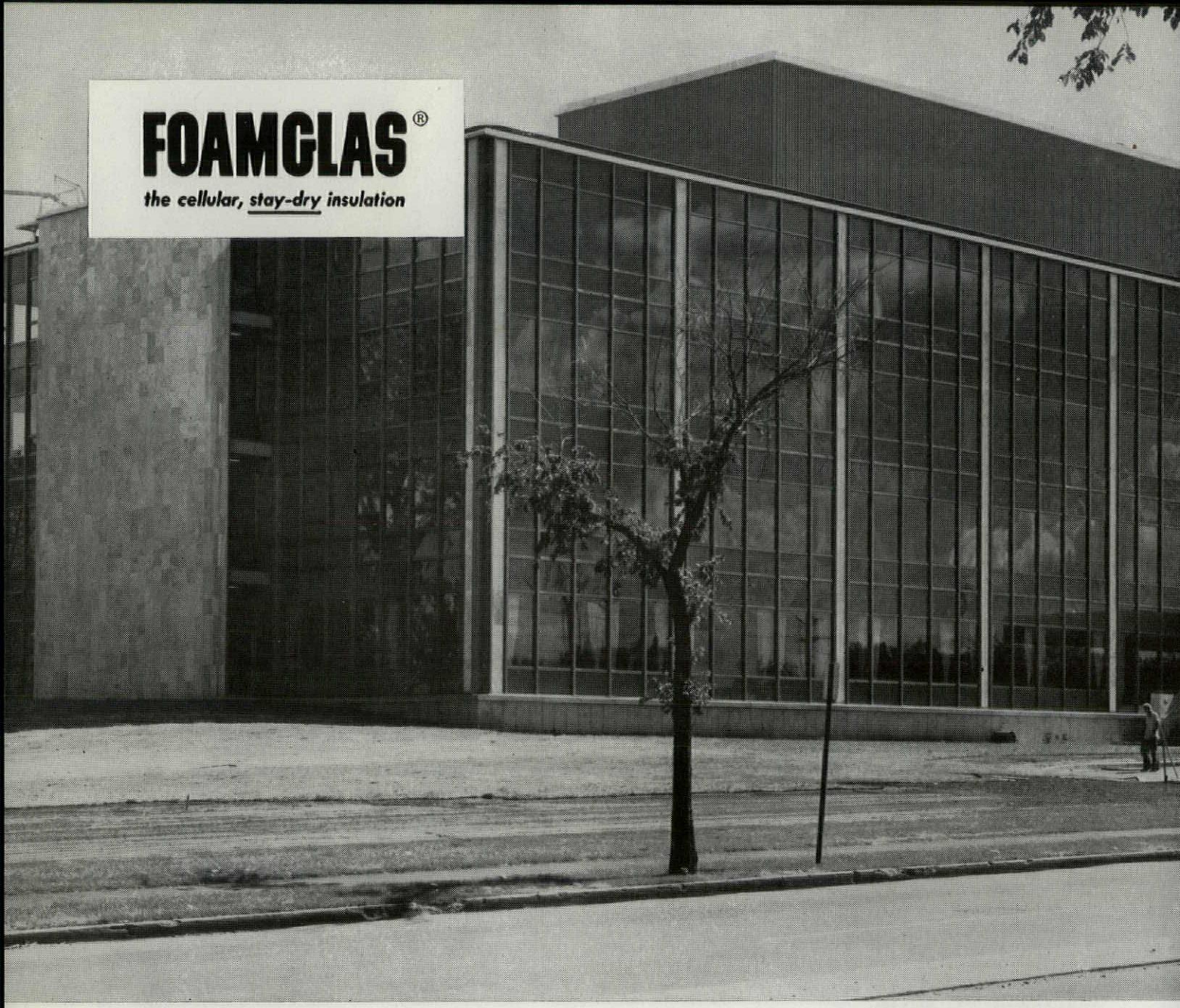
Above: The first I-shaped mullions of architectural bronze are set in place on the 53rd Street side of the East Wing. These are the longest extrusions—26′ 4″—used on the building.

Above, right: End view of one of the I-shaped mullions. Projecting piece at bottom will join the mullion with a waterproofing system behind the stone facing used at the base of the building.

Right: Detail showing how mullions are fastened to building structure at each floor. Special jacks make possible precise positioning before bolts are tightened in steel angles.

Left: The Seagram Building begins to take shape. **Far left:** a model of the Seagram Building as it will appear when finished. Architects: Mies van der Rohe and Philip Johnson. Associate Architects: Kahn & Jacobs. General Contractor: George A. Fuller Company. Architectural Metals Fabricator: General Bronze Corp.





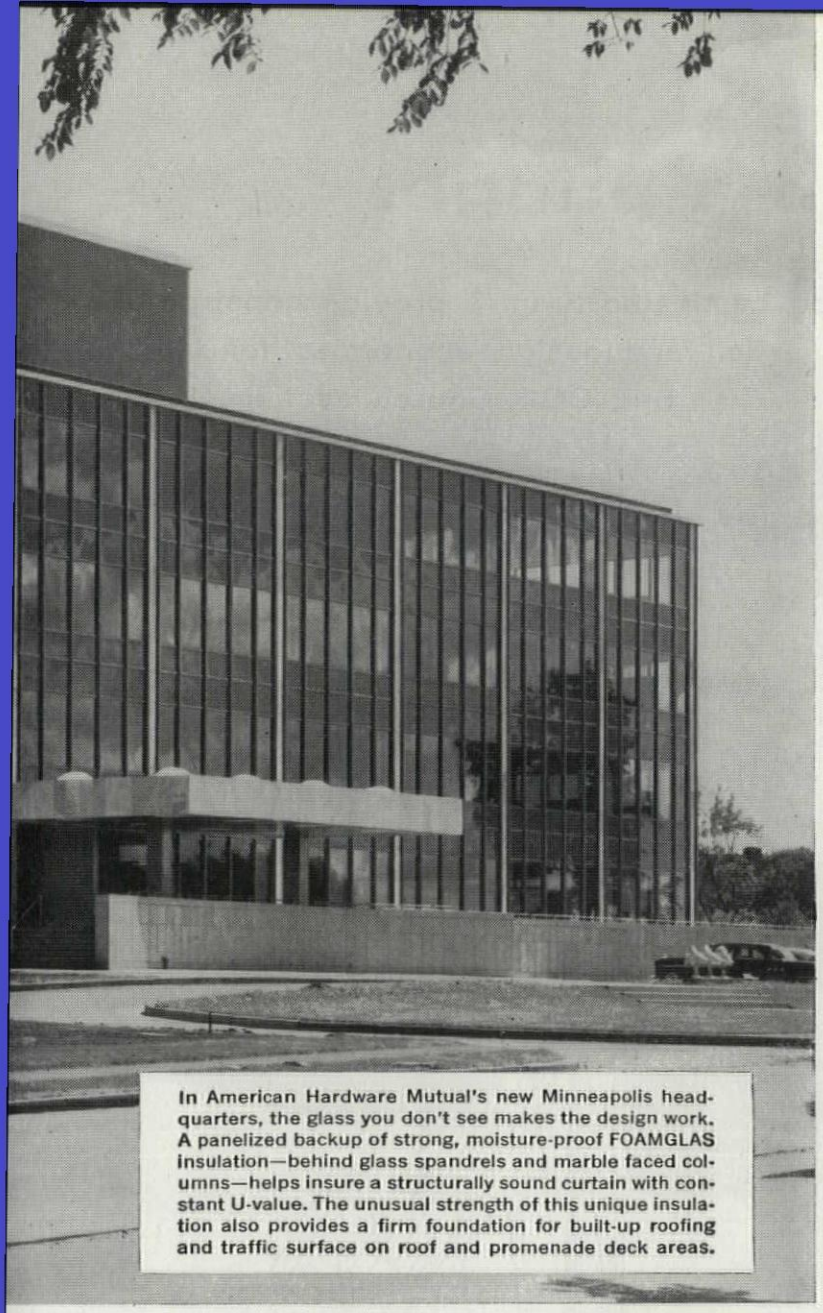
The glass you don't see makes this design work!

Panelized FOAMGLAS spandrel backup adds strength, rigidity; insures constant U-value for American Hardware Mutual's all-glass curtain wall

A new type of curtain wall—all glass, including the insulation—is the key to design of this new $4-million headquarters building for American Hardware Mutual Insurance Company in Minneapolis. Designed by Thorshov & Cerny, Inc., A.I.A., the building's curtain walls consist of vision strips of plate glass separated by spandrel panels of a new opaque glass facing, Spandrelite. Behind spandrel panels and exterior columns, a panelized backup of 2" FOAMGLAS, unique cellular glass insulation, insures constant efficiency and economy in operation of the building's heating and air conditioning systems.

The prime reason for selecting FOAMGLAS was its moisture-proof structure. Composed entirely of non-connecting, sealed glass cells, FOAMGLAS is impervious to the moisture and vapor that destroy efficiency of ordinary insulations. Its insulating performance can never vary.

FOAMGLAS also provides important structural benefits in American Hardware Mutual's curtain wall construction. Its combination of strength, rigidity, dimensional stability and light weight . . . unequalled among insulating materials . . . adds to the structural stability of the curtain. The insulation won't swell,



In American Hardware Mutual's new Minneapolis headquarters, the glass you don't see makes the design work. A panelized backup of strong, moisture-proof FOAMGLAS insulation—behind glass spandrels and marble faced columns—helps insure a structurally sound curtain with constant U-value. The unusual strength of this unique insulation also provides a firm foundation for built-up roofing and traffic surface on roof and promenade deck areas.

shrink or warp, can't sag or slump within the wall. Completely inorganic, it can't rot or deteriorate, either.

You, too, will find that FOAMGLAS is the ideal insulation for *your* curtain wall designs . . . just as it is for most other types of construction. You can quickly demonstrate to yourself the unique combination of properties that makes this true. Send today for a free sample of FOAMGLAS and complete directions for six simple "desk-top" tests which prove its benefits. Address . . .

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Since FOAMGLAS is moisture-proof, it was unnecessary to protect it from the weather during installation . . . as shown by this exterior view taken during construction of the new American Hardware Mutual building. Inset shows spandrel backup pan containing FOAMGLAS about to be installed in curtain wall mullions.

Beauty on a budget

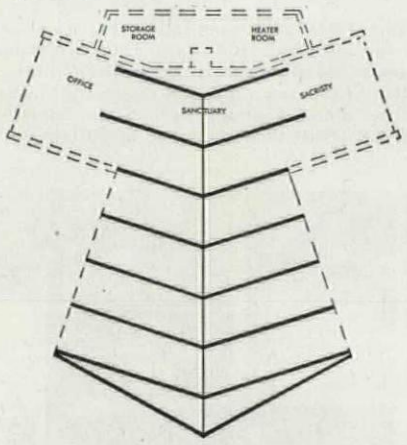
Rilco Laminated Frames provide construction and design economies for this $40,000 Church seating 150



St. Gregory's Episcopal Church, Woodstock, N. Y.
Wm. H. van Benschoten, A. I. A.

Even though it will rest deep in the valley, St. Gregory's seems to reach high above the surrounding hills. For it was planned that way.

So intriguing was this design that we couldn't wait for photos of the finished job. And Rilco Glued Laminated Structural Members so perfectly carried out the desired effect that they were specified throughout — chosen not only for their warmth and flexibility, but for economy plus ease and speed of erection.



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No matter how unusual your design, Rilco Glued Laminated Wood Arches, Beams and Trusses will faithfully portray the desired effect at a saving. You will be pleased, too, with the beauty of 4″ x 5″ Rilco Red Cedar Deck which combines roof insulation and ceiling finish in one economical application.

Rilco engineers will gladly work with you on your requirements and give on the job cooperation. For there's a cost-saving Rilco member for every type of structure, precision built to meet your needs. Just write . . .

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new Andersen Beauty-Line window



a new idea

in

window beauty

from

Andersen Corporation

featuring:

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- **low per-square-foot cost**
- **completely assembled and packaged**
- **fixed and ventilating sash in one unit**
- **seven versatile sizes**
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see for yourself . . .



new Andersen Beauty-
a wide variety of

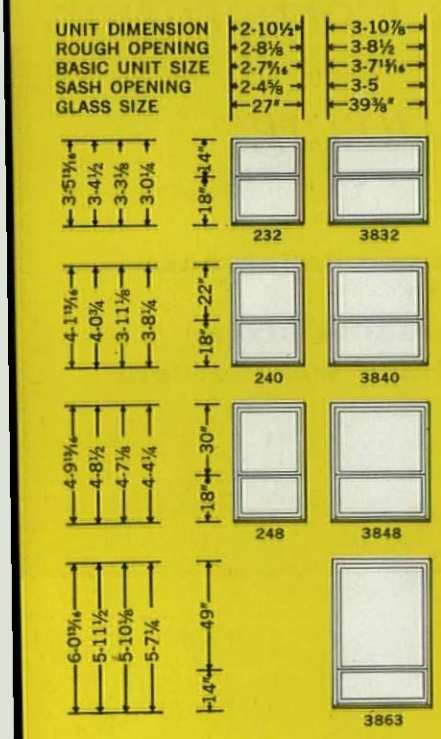


in split level homes new Beauty-Line Windows blend perfectly to match architectural designs no matter what elevation you may have in mind.



in schools and light commercial buildings new Beauty-Line Windows adapt to any exterior elevation, bring vital light and ventilation.

new Beauty-Line window offered in four heights, two widths



Here's a window designed to bring new beauty to a wide variety of architectural styles in residences, schools, light commercial buildings. It's called the Andersen Beauty-Line Window. It has a fixed upper sash over an awning style lower ventilating sash combined in a single unit.

Feature of Andersen's patented design is an exceptionally narrow meeting rail between the upper fixed sash and the lower ventilating sash.

Economies effected in the design, and through the use of a fixed upper sash, bring a low over-all cost per square foot of glass area when you specify the new Beauty-Line Window.

Versatility of the new Beauty-Line Window makes it ideal for solving almost any fenestration problem. It's available in seven sizes with four heights and two widths. All sizes can be easily joined together to form mullions and triples. The Beauty-Line can also be used in conjunction with other Andersen WINDOWALLS.

The new Beauty-Line comes completely assembled and packaged from the factory. Optional features offered include glazing with welded insulating glass, removable double glazing, aluminum frame screen, choice of three types of operating hardware.



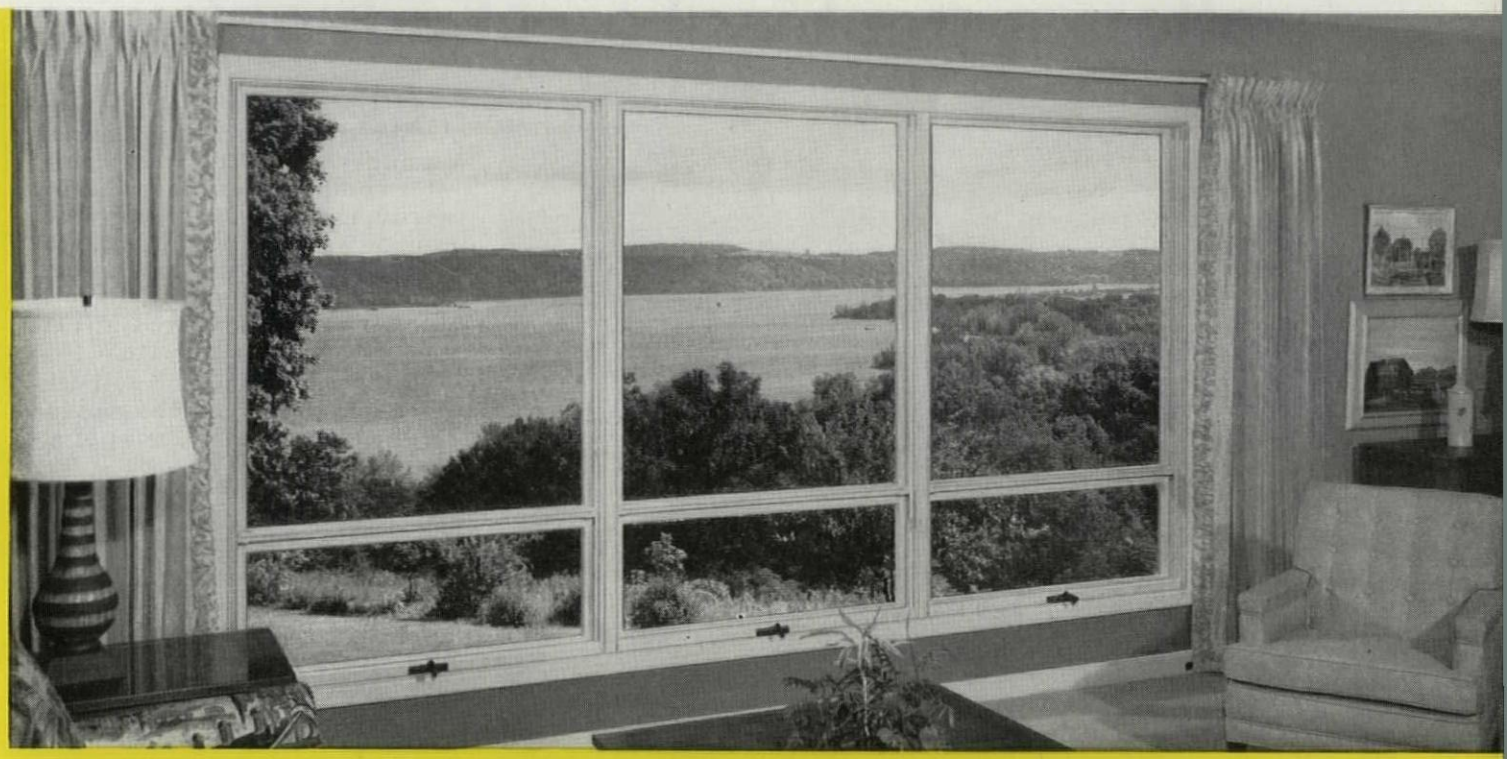
You can get full details and specification data by writing direct to Andersen Corporation. Andersen WINDOWALLS are sold only through lumber and millwork dealers, and are readily available throughout the country, including the Pacific Coast.

Andersen *Windowalls*

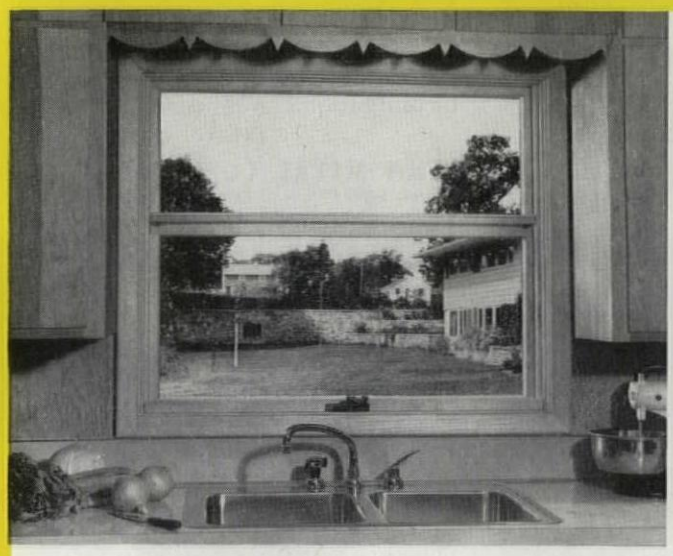
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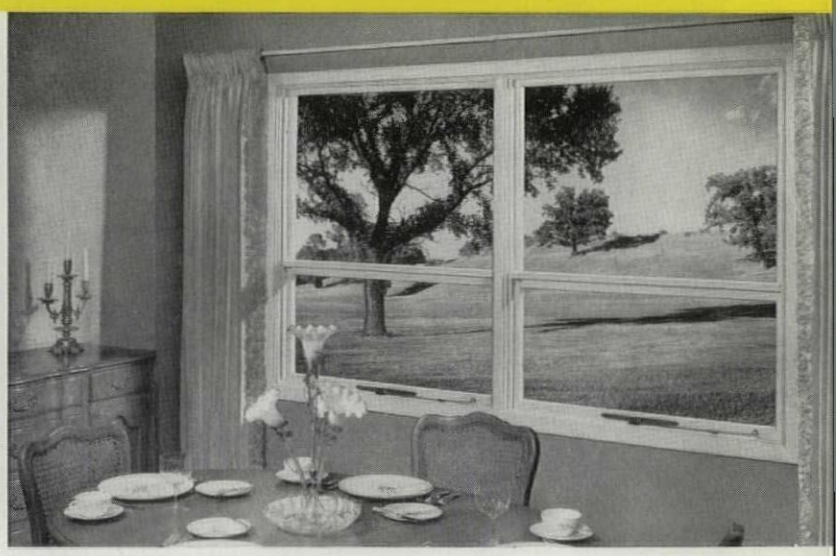
Line window suits building plans!



ideal for living rooms. Tall and handsome 5′10″ high Beauty-Line Windows combine to form glamour Andersen WINDOWALLS so popular in modern family living. Narrow meeting rails are located to give minimum interference with vision in sitting or standing position. Three choices of hardware. Standard Lock, Bar-Lock for low-cost underscreen operation and Roto-Lock (shown on windows above) which also works under screen and pulls sash corners in snug and tight.



ideal for kitchens. Short 3′3″ height of Beauty-Line makes perfect kitchen window for use over kitchen sink or counter. Also serves as excellent privacy window when specified for bedrooms.

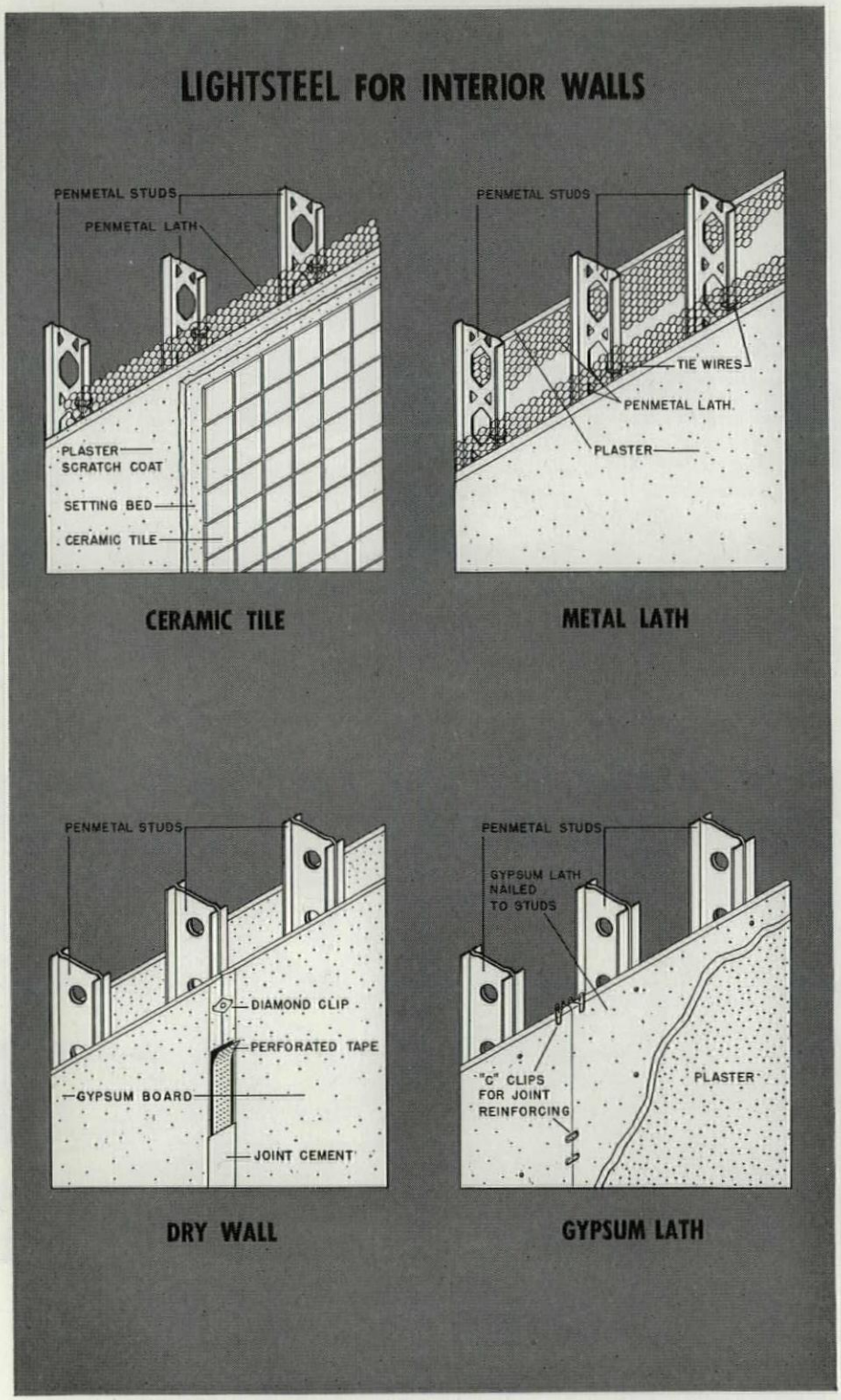


ideal for dining rooms. Medium 4′7″ height of Beauty-Line is useful in dining areas . . . and all through the house. This view shows Andersen Bar-Lock Operator, one of three operating hardware options.

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LIGHTSTEEL

offers a combination of advantages



Architects are specifying increasing quantities of LIGHTSTEEL in new schools—for complete framing, and for specific uses such as interior walls, exterior walls, corridor joists, canapies, floor joists and roof rafters. Because of its versatility, there is scarcely a school where LIGHTSTEEL cannot be used to advantage.

In the case of interior wall construction, LIGHTSTEEL studs provide rapid and economical means of attaching collateral materials. Any materials may be used.

The fire safety and permanence of LIGHTSTEEL cannot be approached by wood studs. It offers all of the advantages of heavier-grade steel without the excessive weight and high cost of overdesign. To achieve comparable sound reduction with masonry would require a wall of two to three times the thickness—which means less floor space, resulting in smaller or fewer classrooms.

Economical to buy, LIGHTSTEEL also cuts erection costs. Complete wall units can be shop assembled, then trucked to the job site for immediate placement.

For complete details of the many advantages of LIGHTSTEEL, send for Catalog and Technical Manual. No cost or obligation.

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Good news for architects! With the AIRTEMP choice of 286 models, you are assured an air conditioning system *precisely suited* to every need—at economical "standard model" cost!

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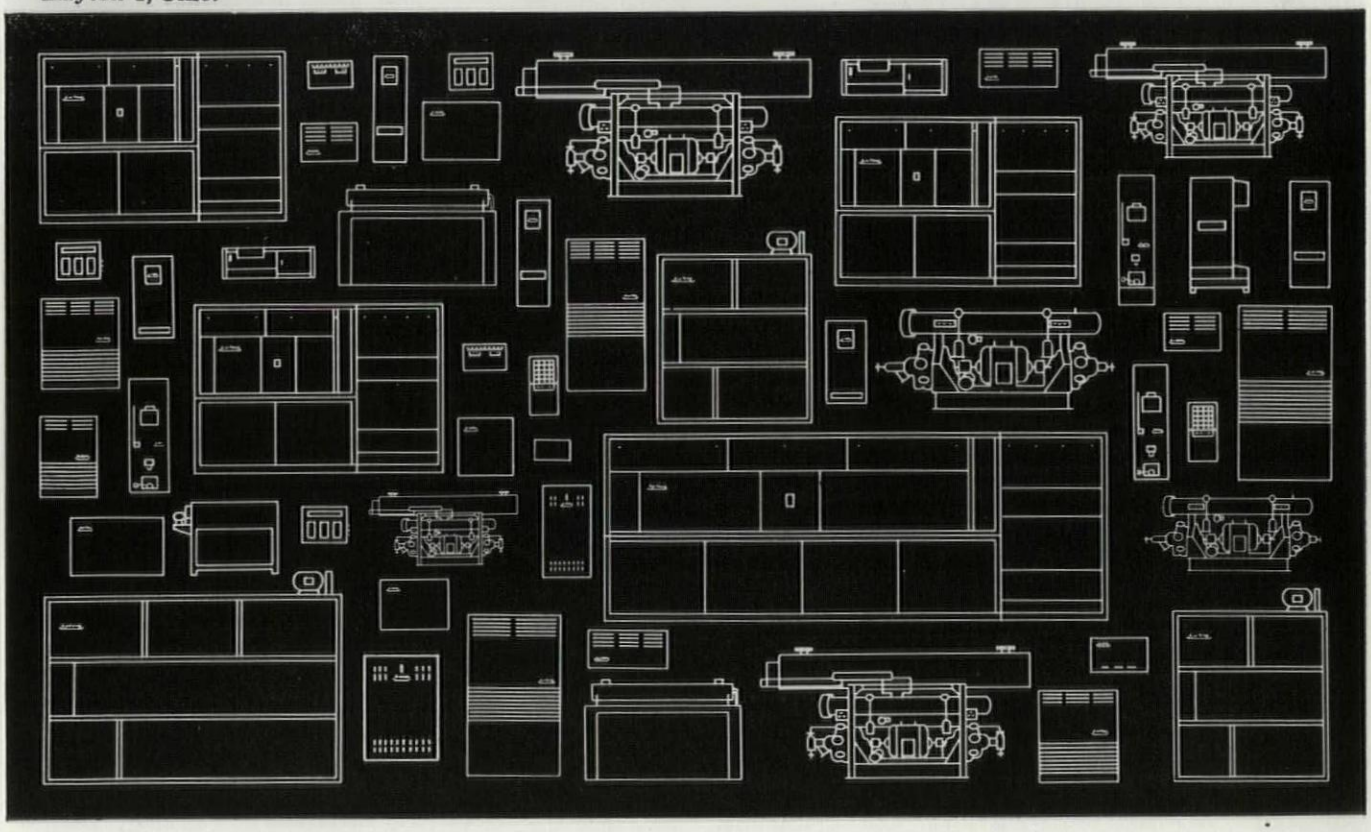
Your factory-trained AIRTEMP dealer or contractor offers a complete selection of air conditioning equipment, too. Air and water-cooled "packaged" air conditioners—central systems—and individual room air conditioners. Phone him! He's in your Yellow Pages.

When you specify AIRTEMP you specify a Chrysler product, a name well known.

ADVERTISED IN LIFE

Airtemp DIVISION CHRYSLER CORP
Dayton 1, Ohio.

the most complete selection offered by any manufacturer



american LUSTRAGRAY* sheet glass
helps provide balanced brightness in schoolrooms

By reducing glare sources, it eliminates eyestrain and fatigue



AMERICAN LUSTRAGRAY, a neutral gray tint glass, permits a balanced brightness between natural and artificial light in schoolrooms. It transmits needed daylight without glare, thereby removing a deterrent to comfort and efficient learning.

Because of these LUSTRAGRAY properties, distinct vision through large glass areas is possible, making the classroom an unconfined, pleasant place to study.

Non-fading LUSTRAGRAY gives the added safety of a heavy strength glass, and yet is very economical —no special installation requirements. Drapes or blinds become optional and are not required.

AMERICAN LUSTRAGRAY is now available through more than 500 glass jobbers. Check your classified telephone directory for listing.

american

***LUSTRAGRAY DATA**

- **Thicknesses: 7/32", 1/4"**
- **Maximum Size: 6' x 10'**
- **Slightly larger sizes on request when available**

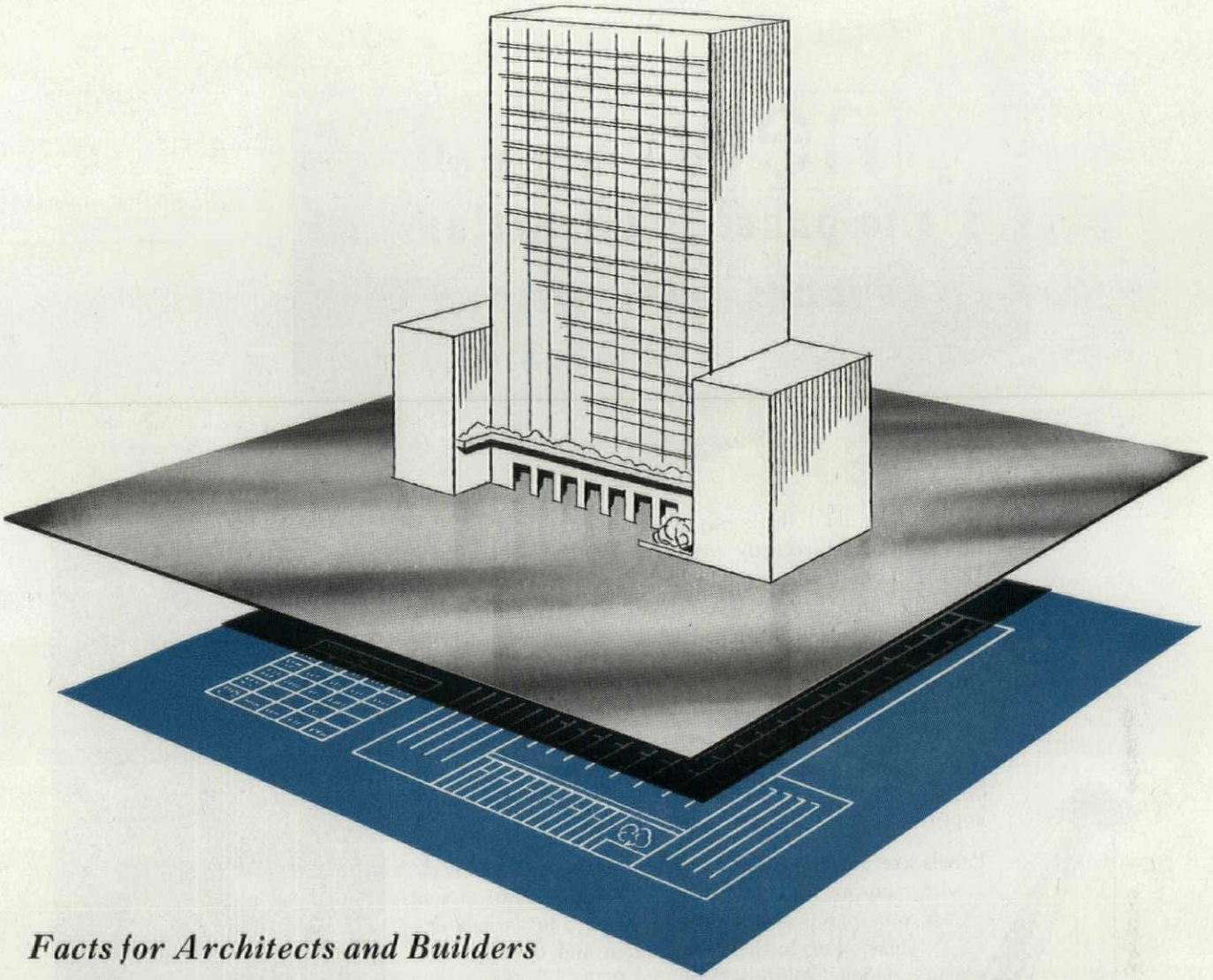
MODERN GLASS
Best at a Glance

AMERICAN

WSW 6392

american
WINDOW *Glass* COMPANY
PITTSBURGH, PA.

PLANTS: ARNOLD, PA. • ELLWOOD CITY, PA.
JEANNETTE, PA. • OKMULGEE, OKLA.



Facts for Architects and Builders

about the profitable use of STAINLESS STEEL

Considered from the practical point of view, stainless steel is often the best, most economical material you can choose. For example:

Exteriors of stainless steel cut building weight by many tons. A .037" stainless wall weighs only 1½-pounds per square foot, compared to 48-pounds for a 4" brick exterior wall. That means you can design for less expensive foundations. And stainless means more rentable floor space . . . good insulation . . . fewer condensation problems.

Hardware, trim, railings and other parts that must take hard use, stay bright and new-looking indefinitely when they're made of stainless. Replacement and maintenance costs are greatly reduced.

Corrosion-Resistance of stainless presents an invisible armor against the attack of city atmospheres, smoke, rust or discoloration. Buildings *keep* the good looks you design into them . . . and, to your clients, stainless is economically superior to other less durable metals.

Maintenance costs take a dive when stainless is used. It never needs waterproofing, painting or refacing as most other materials do.

Installation of stainless presents no problem. Most bending, forming, trimming, drilling or surface finishing can be done in the shop . . . leaving only erection, final cleaning and inspection to be done on the site.

As a leading producer of stainless steels, Crucible is working closely with leading architects in developing new ways of employing stainless. Some of the results are available in a booklet called, "A Guide to Future Uses of Stainless Steel in Architecture and Building." Write now for your free copy. *Crucible Steel Company of America, Henry W. Oliver Building, Pittsburgh 22, Pa.*

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

new thin wall stone panel construction

REDUCES WALL WEIGHT, INSULATES AND SPEEDS ERECTION

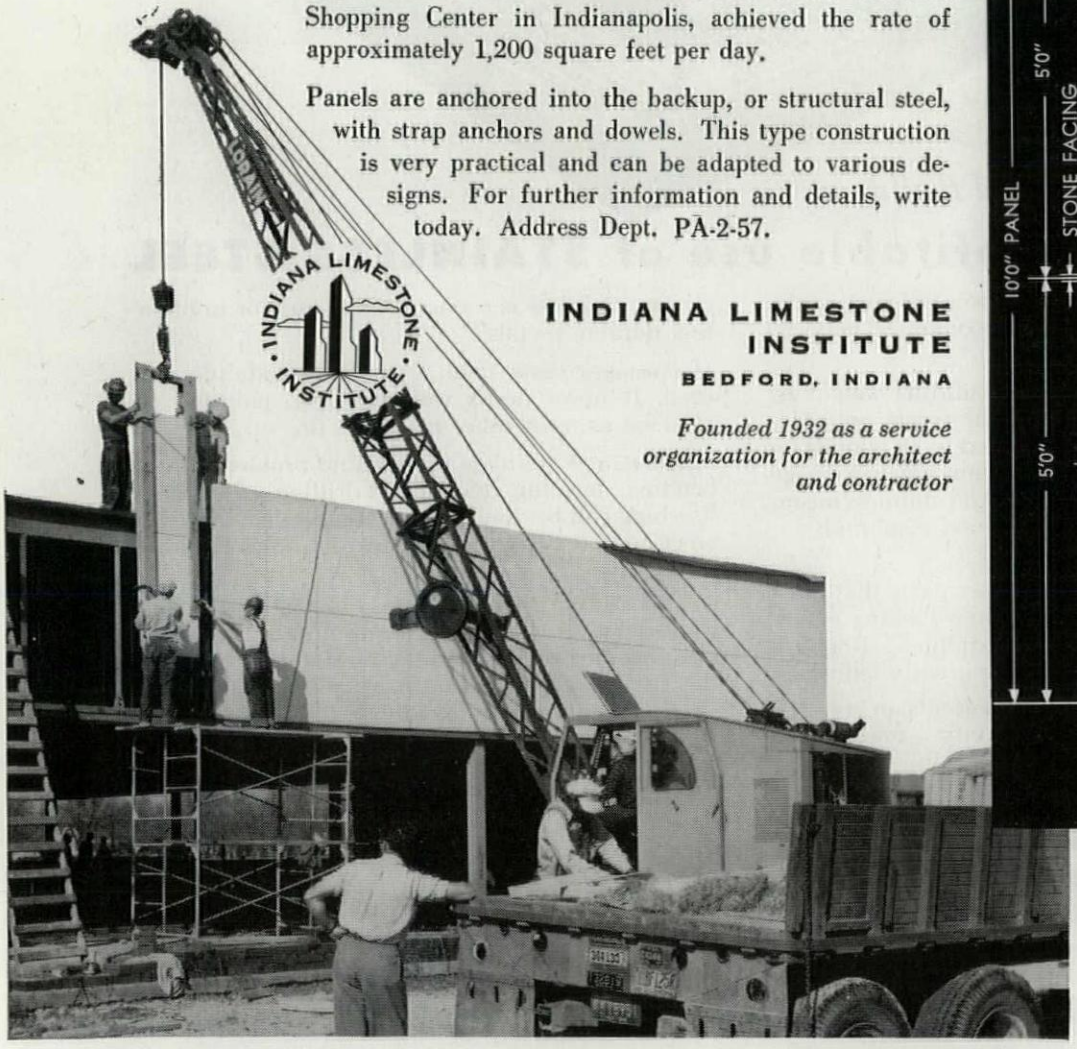
Only 4″ in total thickness, a new thin wall panel recently perfected by the Indiana Limestone Institute which provides a very high insulating value, is composed of 2″ of limestone facing mechanically fastened to 2″ of Tectum, a rigid-type insulating board.

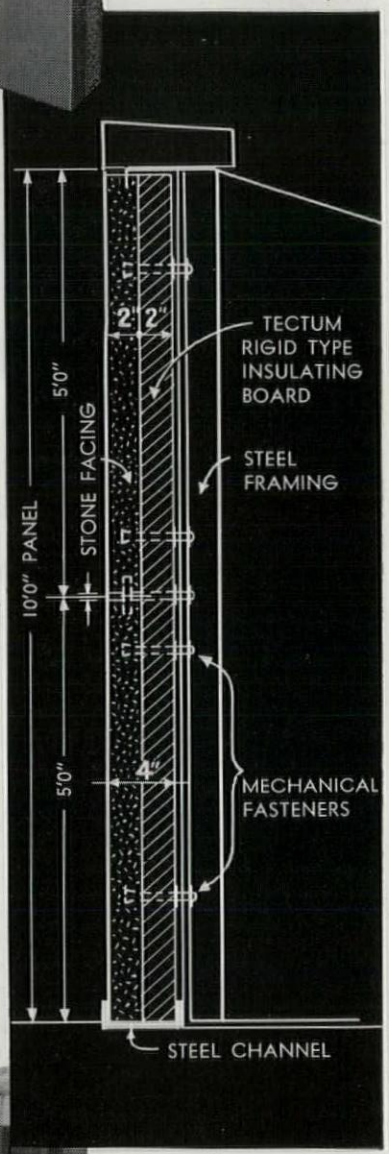
Several pieces of stone applied to a single piece of Tectum are set as one unit, or a large panel. Masons working with this new material for the first time on the Meadows Shopping Center in Indianapolis, achieved the rate of approximately 1,200 square feet per day.

Panels are anchored into the backup, or structural steel, with strap anchors and dowels. This type construction is very practical and can be adapted to various designs. For further information and details, write today. Address Dept. PA-2-57.

INDIANA LIMESTONE INSTITUTE
BEDFORD, INDIANA

Founded 1932 as a service organization for the architect and contractor





WALL DETAIL
Meadows Shopping Center
Indianapolis, Indiana

YOU CAN COUNT ON KEWANEE -ENGINEERED PRODUCTS



his assignment:

TO HELP YOU FORGET

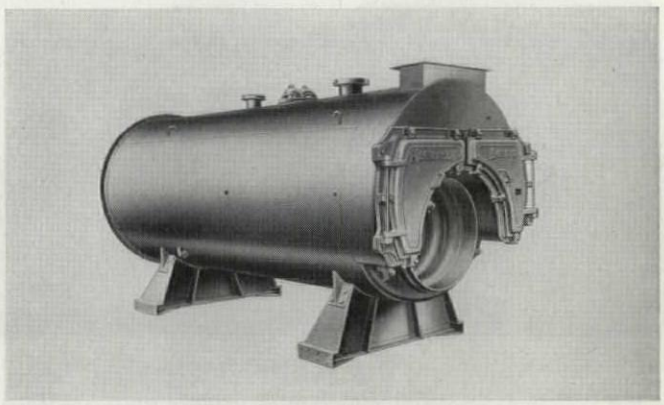


Kewanee Boilers are advertised to your clients regularly in national publications.

Helping you avoid, solve and *forget* your clients' heating or power problems is the prime assignment of your Kewanee man. He's trained for it, experienced in it—a qualified boiler specialist with the data you need, the knowledge you value.

And his catalog carries the exact size and type of boiler you need for any requirement from 70,000 btu's for a small home up to 651 h.p. for an industrial plant. Every unit fulfills the nation-wide Kewanee reputation for efficiency, fuel economy, low maintenance and long life . . . backed by 89 years of experience.

Kewanee men serve you from a coast-to-coast network of Kewanee Branch Offices. A telephone call brings the nearest one to work with you. American-Standard, Kewanee Boiler Division, 101 Franklin Street, Kewanee, Illinois.



When boiler room space is limited, this Kewanee M-800 Series is an ideal source for 15 lbs. steam or 30 lbs. water or high pressure steam 125 lbs. and up.

AMERICAN-Standard

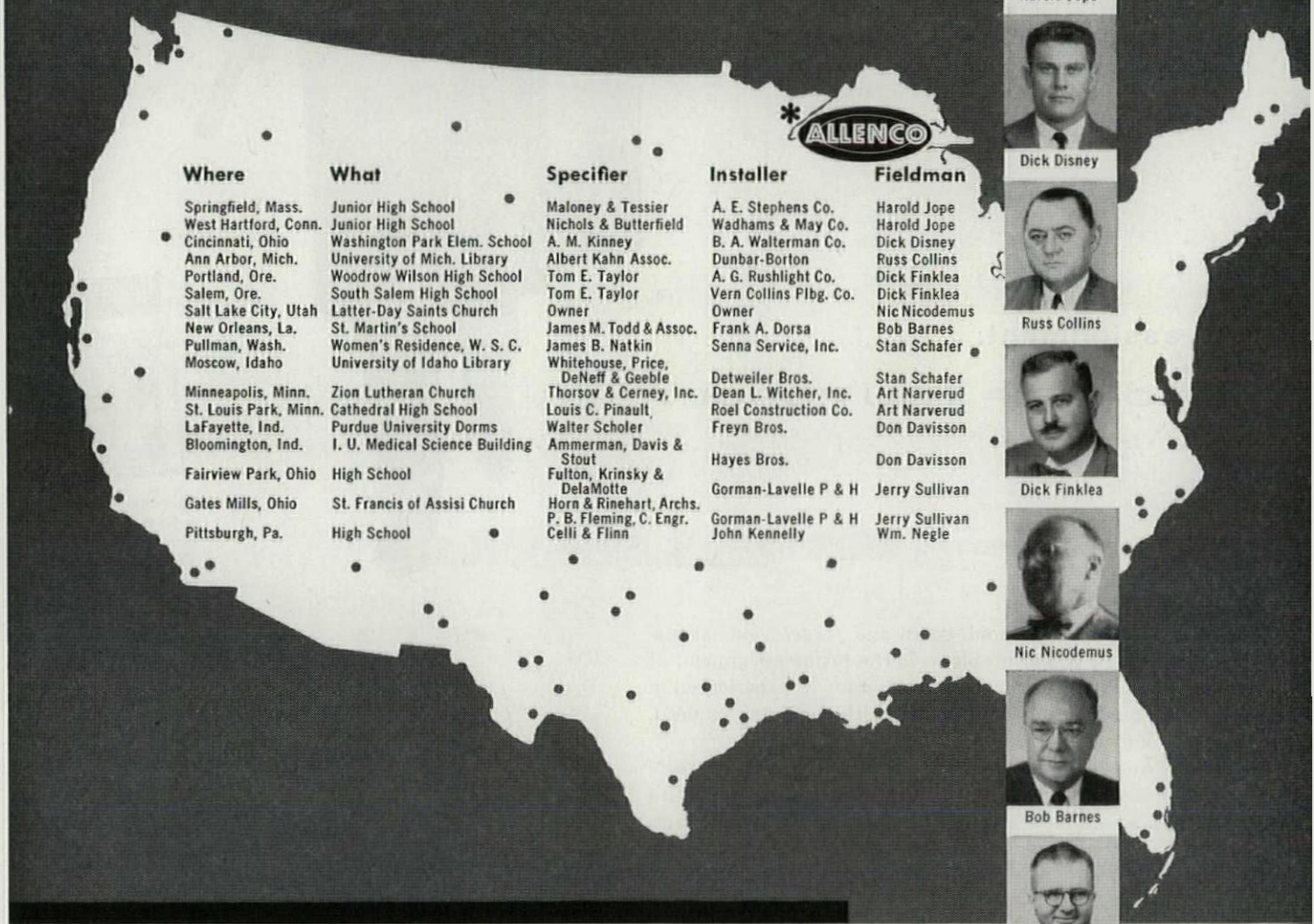
KEWANEE BOILER DIVISION

Architects, Engineers and Contractors prefer



ALLENCO

Here are a few recently completed installations:



Where	What	Specifier	Installer	Fieldman
Springfield, Mass.	Junior High School	Maloney & Tessier	A. E. Stephens Co.	Harold Jope
West Hartford, Conn.	Junior High School	Nichols & Butterfield	Wadhams & May Co.	Harold Jope
Cincinnati, Ohio	Washington Park Elem. School	A. M. Kinney	B. A. Walterman Co.	Dick Disney
Ann Arbor, Mich.	University of Mich. Library	Albert Kahn Assoc.	Dunbar-Borton	Russ Collins
Portland, Ore.	Woodrow Wilson High School	Tom E. Taylor	A. G. Rushlight Co.	Dick Finklea
Salem, Ore.	South Salem High School	Tom E. Taylor	Vern Collins Plbg. Co.	Dick Finklea
Salt Lake City, Utah	Latter-Day Saints Church	Owner	Owner	Nic Nicodemus
New Orleans, La.	St. Martin's School	James M. Todd & Assoc.	Frank A. Dorsa	Bob Barnes
Pullman, Wash.	Women's Residence, W. S. C.	James B. Natkin	Senna Service, Inc.	Stan Schafer
Moscow, Idaho	University of Idaho Library	Whitehouse, Price, DeNeff & Geeble	Detweiler Bros.	Stan Schafer
Minneapolis, Minn.	Zion Lutheran Church	Thorsov & Cerney, Inc.	Dean L. Witcher, Inc.	Art Narverud
St. Louis Park, Minn.	Cathedral High School	Louis C. Pinault	Roel Construction Co.	Art Narverud
LaFayette, Ind.	Purdue University Dorms	Walter Scholer	Freyn Bros.	Don Davisson
Bloomington, Ind.	I. U. Medical Science Building	Ammerman, Davis & Stout	Hayes Bros.	Don Davisson
Fairview Park, Ohio	High School	Fulton, Krinsky & DelaMotte	Gorman-Lavelle P & H	Jerry Sullivan
Gates Mills, Ohio	St. Francis of Assisi Church	Horn & Rinehart, Archs. P. B. Fleming, C. Engr.	Gorman-Lavelle P & H	Jerry Sullivan
Pittsburgh, Pa.	High School	Celli & Flinn	John Kennelly	Wm. Negle


Harold Jope

Dick Disney

Russ Collins

Dick Finklea

Nic Nicodemus

Bob Barnes

Stan Schafer


Art Narverud

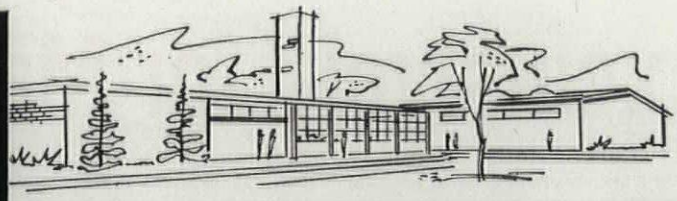
* **ALLENCO** *Fieldmen, operating from offices in 35 principal cities, offer prompt and useful help. Check "Fire Protection" in your classified phone directory or write for address of nearest office.*

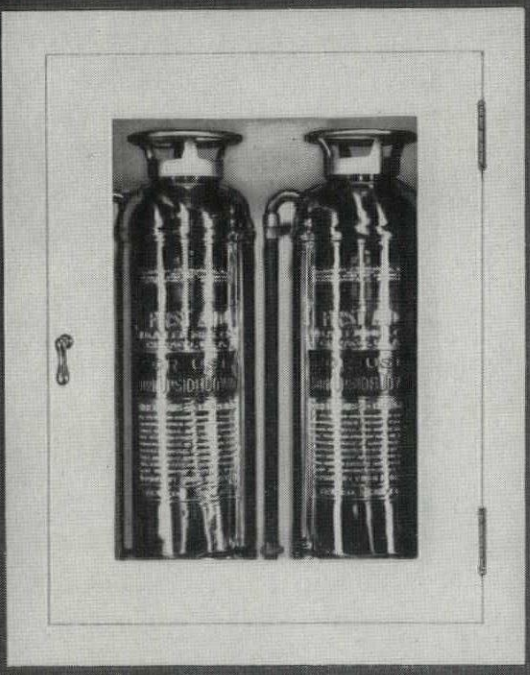
W. D. ALLEN MANUFACTURING CO.

Room 700 Allenco Bldg. • 566 W. Lake St. • Chicago 6

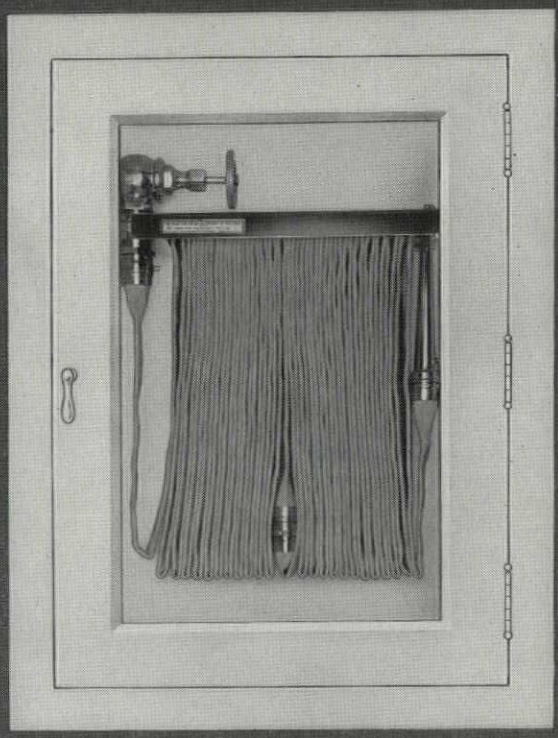
For Interior Fire Protection in SCHOOLS and CHURCHES . . .

Of the many distinct ALLENCO *models, these two are most popular for installations in this field.*





Allenco Fig. 285 is notably compact, contains one or two fire extinguishers and, if specified, tamperproof door.



Allenco Fig. 262 is "custom-sized" to suit choice of 5 hose-lengths, 4 hose-sizes with plain or fog nozzles, with optional spanner and bracket, and space limitations of any application-point.

Cabinets of both units are available in several groups—Allenco Satin Finish Hollow Steel Door, Nella Sheet Steel Door, Aluminum Doors, and other styles. Rigid and true-to-size, they go in faster . . . look better . . . serve perfectly.

Catalog 150
(A.I.A. file 29e2)
contains full details in simplest form, including standard quotable specifications.
Write for your copy now . . .



ALLENCO

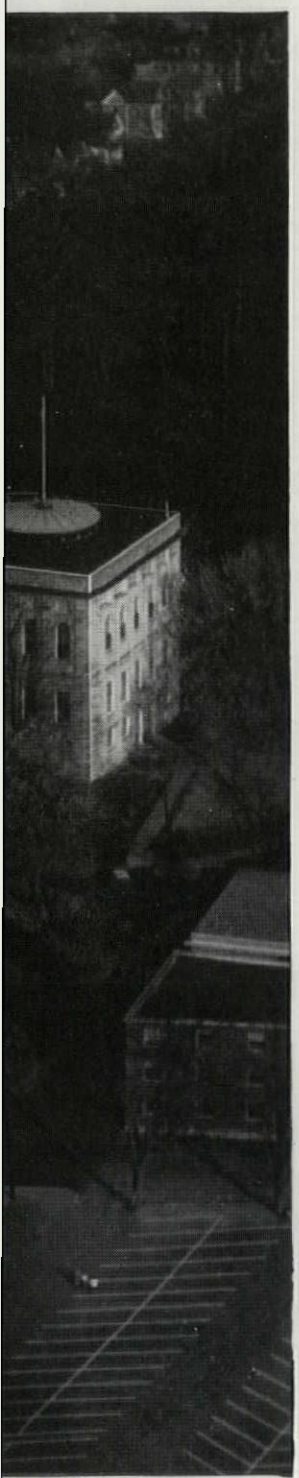
5 miles of Gold Seal® Floors exclusively for Maine State Office

ARCHITECTS: Miller & Beal, Inc., Portland, Maine. ASSOCIATE ARCHITECTS: Desmond & Lord, Boston, Mass. FLOORING CONTRACTOR: Portland Veos Tile and Flooring Co., Inc., Portland, Maine.



Aerial view of the new Maine State Office Building with the Capitol building at the rear.

specified Building!





Here's an interior view showing a small part of the installation of Gold Seal Inlaid Linoleum. Actually, about 3½ acres of floor space are covered with this ⅛" burlap-backed "Veltone."

MORE than 148,000 square feet of Gold Seal Veltone® ⅛" Inlaid Linoleum has been specified and installed in the new Maine State Office Building at Augusta, Maine.

Originated by Gold Seal, "Veltone" provides an attractive, long-wearing, all-over decoration for use in all public buildings, schools, hospitals, offices, etc. Veltone's excellent resiliency provides quiet and comfort under foot. The unique design of this Inlaid Linoleum literally hides foot marks . . . it's exceptionally easy to clean and keep clean because of its density and surface smoothness. This ease of maintenance naturally reduces the expense of building service and upkeep. For those who prefer the modern textured look in Inlaid Linoleum, Gold Seal offers Sequin®—⅛" thick—with all the advantages of "Veltone."

Gold Seal Vinylbest* Tile and Gold Seal Asphalt Tile were also used in special areas such as the food and photo laboratories.

Specifications—Gold Seal Veltone: 6′ wide yard goods, ⅛" gauge, burlap-backed. Install over suspended wood, or suspended concrete under-floors. Available in 8 colors—Pompeian Grey, Heather Tan, Spicewood, Bermuda Grey, Light Tan, Grey, Brown, Surf Green. Also made in standard gauge for residential use—in 9 colors.

Send for Free Technical Data Book—"Why Resilient Floors"—containing 36 pages of information to help you specify the correct resilient floor for any type of commercial, institutional or residential building. Address Architects' Service Department, Gold Seal Floors and Walls, Congoleum-Nairn Inc., Kearny, N. J.

PROVIDE YOUR CLIENTS WITH THE FINEST IN FLOORING — SPECIFY GOLD SEAL

FOR HOME...BUSINESS...INSTITUTIONS:

BY THE YARD AND TILES—Inlaid Linoleum • Nairon® Plastics • Vinylbest* Tile • Cork Tile • Rubber Tile Asphalt Tile

PRINTED FLOOR AND WALL COVERINGS—Congoleum® and Congowall®

RUGS AND BROADLOOM—LoomWeve®

SATISFACTION GUARANTEED OR YOUR MONEY BACK

© 1957 CONGOLEUM-NAIRN INC., KEARNY, N. J.

FOR THE LOOK THAT'S YEARS AHEAD

Gold Seal® FLOORS AND WALLS

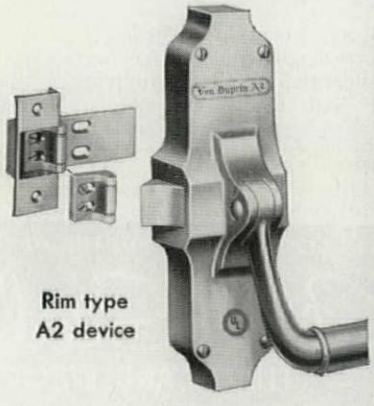
*Trademark

Von Duprin

FIRE AND PANIC EXIT DEVICES



Durable . . . Dependable . . . Demanded



Rim type
A2 device

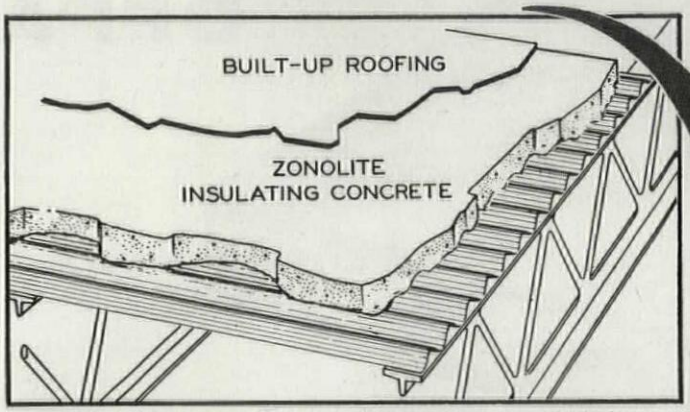
• Built to last, designed to absorb punishment, Von Duprin Exit Devices handle the heaviest traffic any building can offer. There's efficiency at your door with Von Duprin on the job.

Whether seldom used or in constant service, these are the devices for effortless safety, even in the panic of that once-in-a-lifetime emergency. Many Von Duprin devices are still providing this service after 40 exacting years of use, with only normal maintenance. Architects, builders, building superintendents—the men who know—insist on Von Duprin, exit devices that always stand ready . . . for "the safe way out."

VONNEGUT HARDWARE CO. • VON DUPRIN DIVISION • INDIANAPOLIS 9, INDIANA

How Zonolite® Vermiculite CONCRETE
Poured-In-Place Over Corrugated Metal

NOW MAKES POSSIBLE LOW COST • LIGHTWEIGHT • FIRESAFE INSULATING ROOF DECKS!



Zonolite concrete over corrugated metal...Diagram of roof deck just completed on huge shopper's mart in Bridgeville, Pennsylvania.



Pouring 300,000 sq. ft. of vermiculite concrete gets underway.



This type of joist used where span exceeded 25 ft.



Placing corrugated metal.



Side clips fasten corrugated metal to bar joists.



Mixermobile. Zonolite concrete being hoisted to roof.



Easy pouring from concrete buggy. Bulb tee used for screed.



View on the W. T. Grant Co. store—3" Zonolite concrete over metal. Super fire-safe.



Construction Superintendent says this deck went on 20% faster.

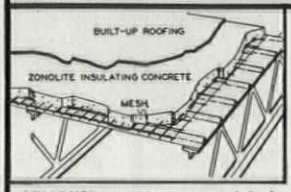
The construction industry has found the new Zonolite roof deck systems to be *superior to all others.* This shopper's mart in Pennsylvania (300,000 sq. ft. of Zonolite deck and marquees) went on 20% faster than another type deck used on part of the same job. Also, it was lighter weight and excelled in fire-safety, saving $1,000 a year on insurance premiums. This Zonolite-over-corrugated-steel and the four other systems shown here are only a small portion of the combinations now made possible. Send for free booklet "Systems of Lightweight Construction."

ZONOLITE COMPANY

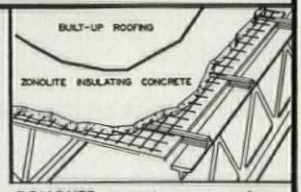
135 So. LaSalle St., Chicago 3, Illinois

These Lightweight Decks Excel in Fire-safety, Permanence!

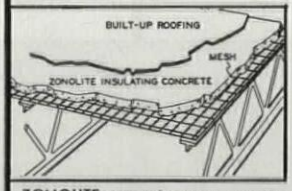
And Zonolite Is Adaptable To Any Roof Deck Design



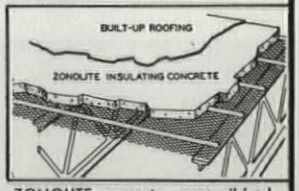
ZONOLITE concrete over metal deck.



ZONOLITE concrete over various form boards.



ZONOLITE concrete over paper-backed wire lath.



ZONOLITE concrete over ribbed metal lath.

MAIL COUPON TODAY

Zonolite Company, Dept. PA-27
135 S. LaSalle Street, Chicago 3, Illinois

Please send me your new booklet, G-101 "Systems of Lightweight Construction."

Name_____

Firm Name_____

Address_____

City_____ Zone_____ State_____

Architect_____ Builder_____ Other_____

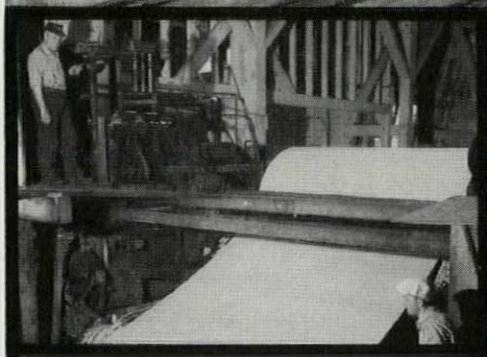


Get This FREE BOOK

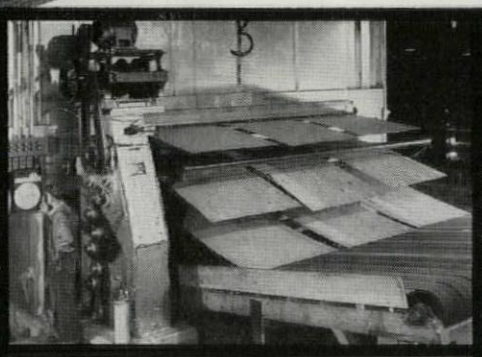
Just off the press. A book you'll want for quick reference...gives details of many roof deck systems...including design data, section drawings, ratings, etc. No obligation. Mail coupon.



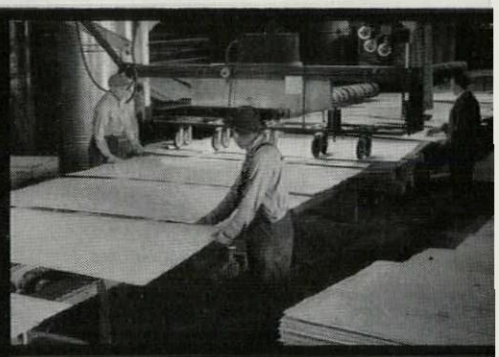
®Douglas Fir Plywood Association, Tacoma 2, Washington



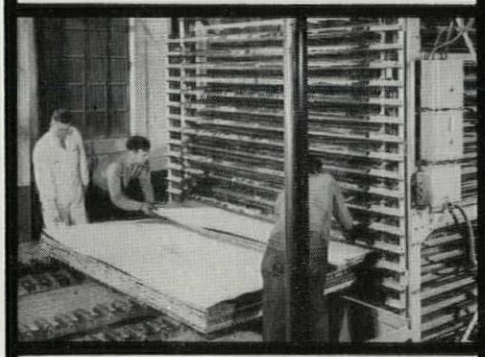
1 **AT THE LATHE,** veneer is checked for uniform thickness. This provides correct thickness of finished panel and permits optimum glue spread.



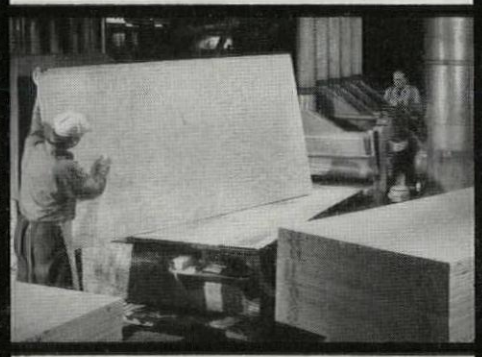
2 **AT THE DRIER,** veneer is checked for correct moisture content, which gives maximum dimensional stability and proper glue bond.



3 **AT VENEER GRADING BELT,** checks are made of both *inner* and *outer* plys for compliance with rigid industry and U.S. Commercial Standards.



6 **AT THE PRESS,** check for correct and uniform pressure and temperature; correct time under pressure to secure perfect glue bond.



7 **IN THE FINISHING DEPT.,** check carefully for grade and appearance. Check accuracy of dimensions and thickness. Apply grade-trademarks.



8 **IN THE DFPA LABORATORY,** independent glue-line testing of samples backs up mill inspectors. Plywood samples tested must meet rigid

means dependable plywood!

by a rigid 8-POINT -Industry quality program

DFPA grade-trademarks are for your protection—your sure guide to plywood of dependable quality and value. Here's why:

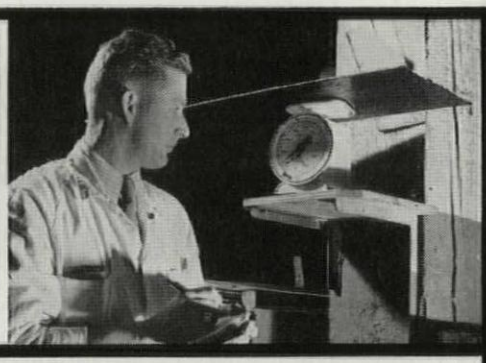
Before being licensed to use DFPA trademarks, every manufacturer under Douglas Fir Plywood Association quality control program must first pass rigid inspection and testing of current plywood production. Glues used in trademarked panels must also first pass DFPA tests under actual manufacturing conditions. Use of the DFPA grade-trademarks may be withdrawn if quality is not satisfactory.

Mills must pass continuous inspection thereafter to maintain privilege of using DFPA trademarks. Each shift is checked several times each month by DFPA quality supervisors. Here, inner plys (unseen in the finished panel) are checked most carefully along with glue and outer plys.

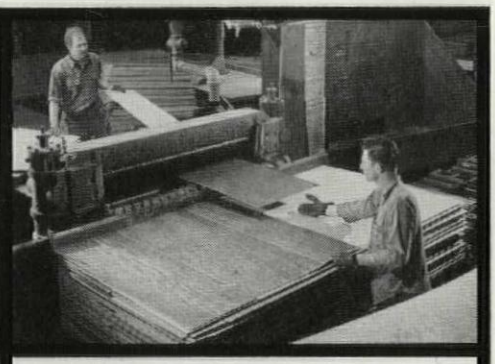
Scientific testing in DFPA laboratories of thousands of samples of current production is a further check in determining glue-line quality and durability.

Only DFPA quality-tested panels bear DFPA trademarks. Don't be misled by imitations; look for letters "DFPA"

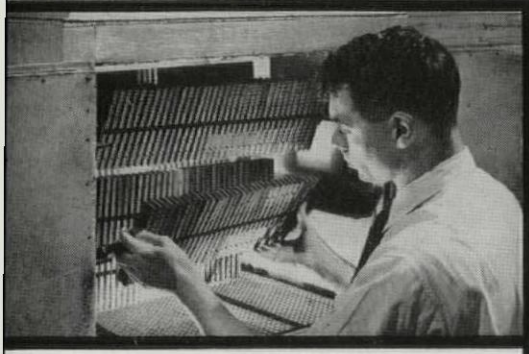


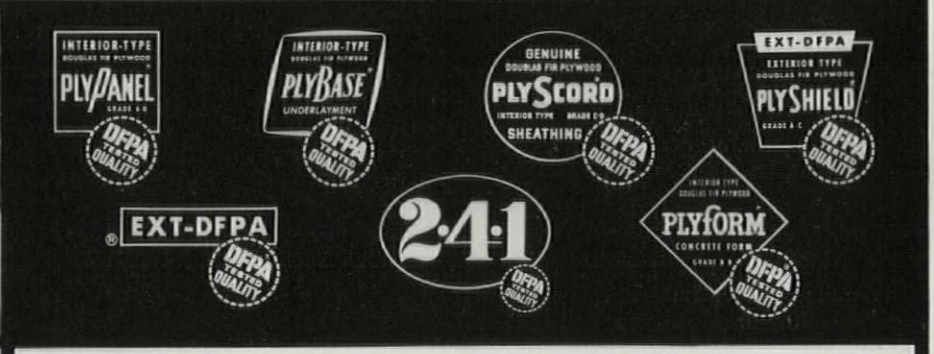


4 **AT THE GLUE MIXER,** check for complete adherence to glue manufacturer's mixing directions. Special formulae developed by million dollar glue company research programs. Before any glue is approved for use in plywood, the manufacturer *must* submit products for performance testing under factory conditions.



5 **AT THE GLUE SPREADER,** check for precise amount and uniform coverage of adhesive. Check proper curing time, recheck veneer condition.





industry standards in order to merit grademarking. U. S. Commercial Standard CS45-55 establishes *minimum* performance specifications. DFPA requirements are even *more* rigid.

DFPA TESTED QUALITY

Registered DFPA grade-trademarks appear on back or edge of panel. Letters "DFPA" indicate manufacture under industry quality program. In addition, symbols designate type and grade. DFPA owns trademarks, licenses its members to use them only as long as quality is maintained.



SANITATION is all-important here, and with Jamison Stainless Steel Clad Doors, cleaning is simplified, maintenance is no problem. Note Jamison Door Closer that saves refrigeration.



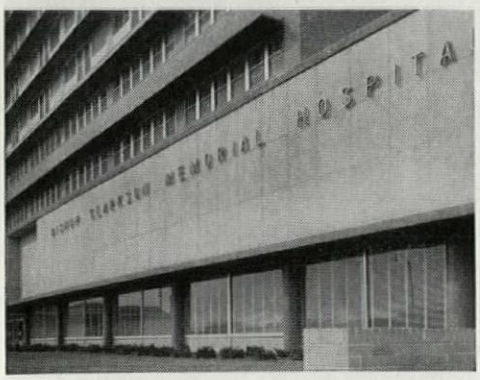
FOUR-WINDOW refrigerator front—also stainless steel clad—glazed with three thicknesses of plate glass ¼″ thick. Sturdy hardware is chromium plated heavy cast bronze.

*The Bishop Clarkson Memorial Hospital was the winner of the 1955 "Hospital of the Year" award.

Gleaming JAMISON stainless steel clad doors selected for "Hospital of the Year"*

Like the new Bishop Clarkson Memorial Hospital in Omaha, Nebraska, more and more hospitals (and hotels and restaurants) are specifying stainless clad Jamison Doors to meet their rigid sanitary requirements at economical cost. Jamison's unmatched experience plus complete flexibility of design is your assurance of the practical solution to any door problem.

"How to Select and Specify Cold Storage Doors"—a helpful booklet you should have—answers your questions on the many factors involved in specifying cold storage doors. For your copy write to Jamison Cold Storage Door Co., Hagerstown, Md.



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Omaha, Nebr.

Contractor:
Peter Kiewit & Sons Co.
Omaha, Nebr.

Insulator:
Kelley Asbestos Prods. Co., Omaha, Nebr.

JAMISON
HAGERSTOWN, MARYLAND, U. S. A.

More JAMISON Doors are used by *more* people than any other Cold Storage Door in the world.



Welton Becket & Assoc. and Howell Lewis Shay & Assoc., Architects. Italian Marble & Mosaic Co., Tile Contractors. Photos: Lawrence S. Williams.

MOSAIC® *The only complete ceramic tile line from America's largest ceramic tile manufacturer*

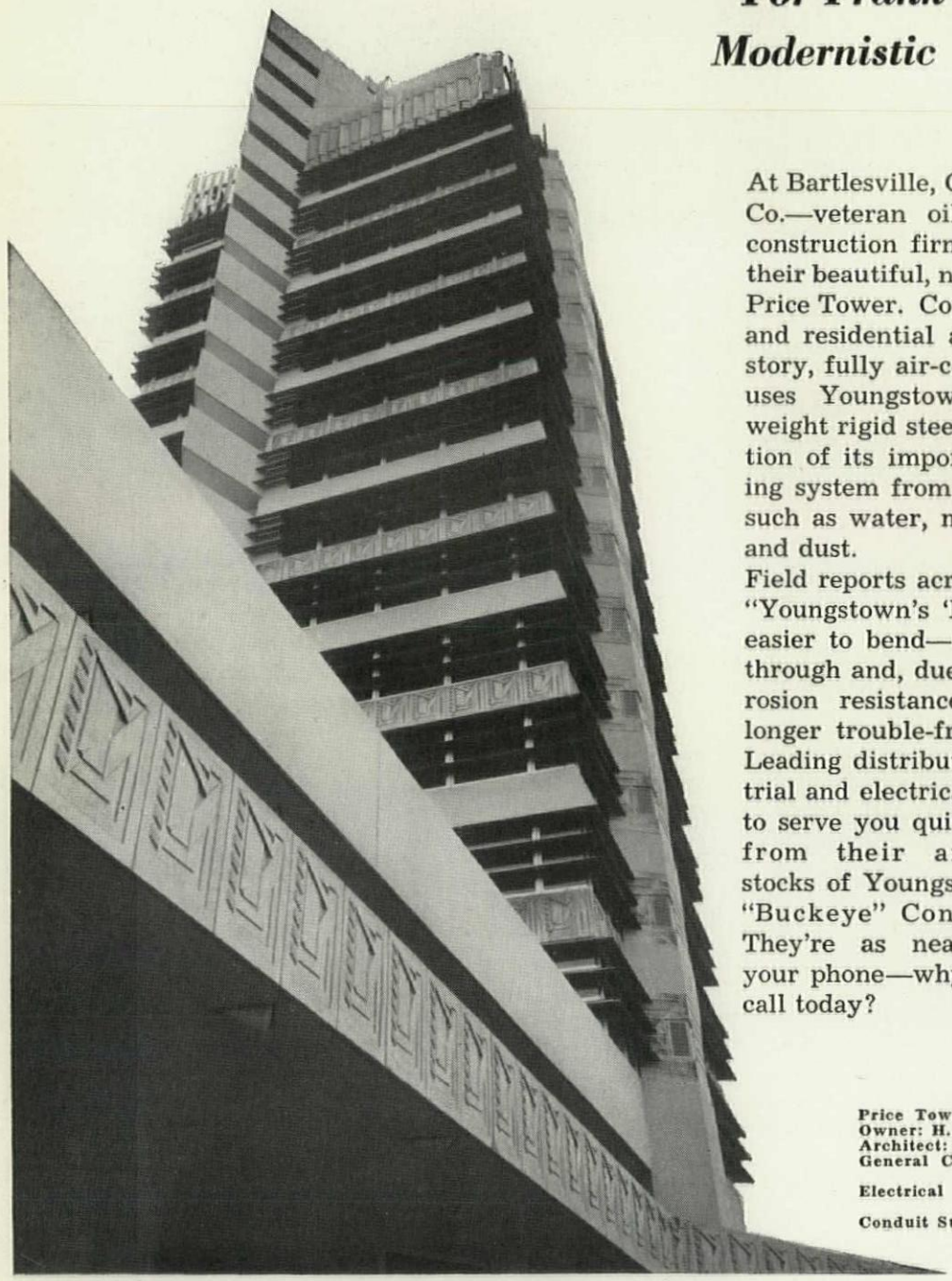
Ask your Mosaic Representative for helpful, informative Mosaic literature or write THE MOSAIC TILE COMPANY, Dept. 28-35 Zanesville, Ohio. Member: Tile Council of America and The Producers' Council, Inc.

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YOUNGSTOWN "BUCKEYE" CONDUIT

. . . *Provides Lifetime Wiring Protection For Frank Lloyd Wright's Modernistic Price Tower*



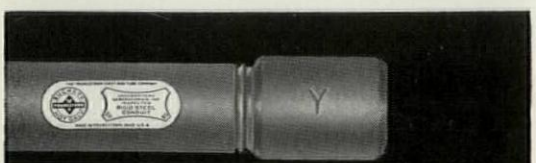
At Bartlesville, Okla., the H. C. Price Co.—veteran oil and gas pipeline construction firm — recently opened their beautiful, new cantilever-design Price Tower. Containing both offices and residential apartments, this 19-story, fully air-conditioned structure uses Youngstown "Buckeye" full-weight rigid steel conduit for protection of its important electrical wiring system from damaging elements such as water, moisture, vapor, dirt and dust.

Field reports across-the-nation state: "Youngstown's 'Buckeye' Conduit is easier to bend—easier to fish wires through and, due to its superior corrosion resistance, affords a much longer trouble-free service life."

Leading distributors in every industrial and electrical market are ready to serve you quickly and efficiently from their ample stocks of Youngstown "Buckeye" Conduit. They're as near as your phone—why not call today?

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Owner: H. C. Price Co.
Architect: Frank Lloyd Wright
General Contractor: Culwell Construction Co., Oklahoma City, Okla.
Electrical Contractor: Industrial Electric Co., Oklahoma City, Okla.
Conduit Supplier: Westinghouse Electric Supply Co., Oklahoma City, Okla.



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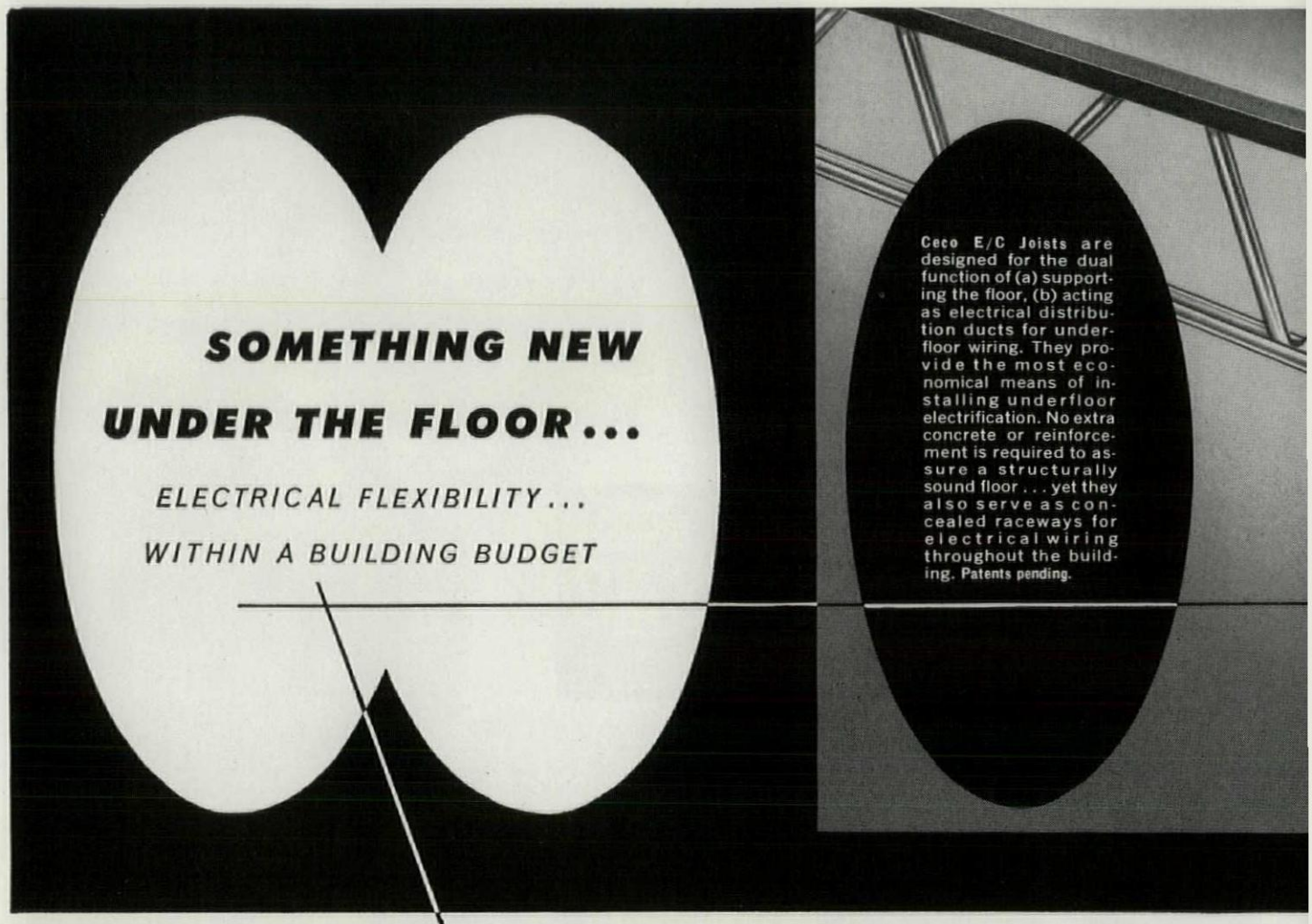
Rush me Vari-Vac profit details (Bulletin 2101)

Name.....

Company.....

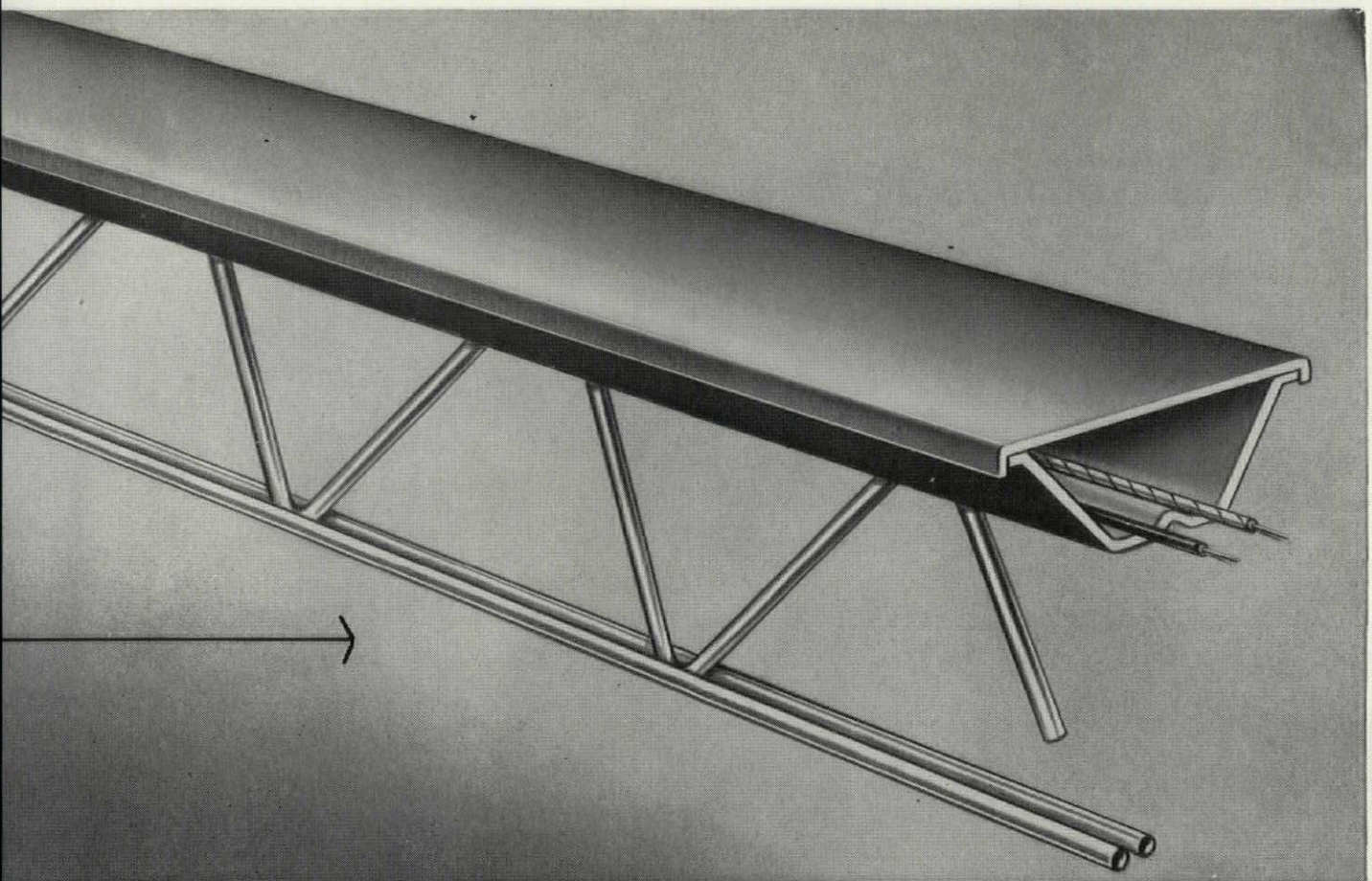
Street.....

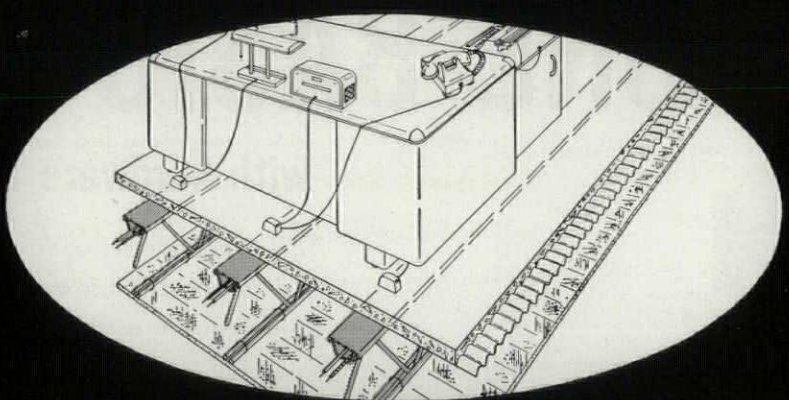
City..... Zone..... State.....



New exclusive CECO Electro-Channel Steel Joist Construction for Underfloor Electrical Systems Saves Time . . . Saves Weight . . . Costs Less, Too

Building planners recognize the basic fact that in this "electrical age" buildings must be wired for the *future*. To provide only for today's requirements is not enough. Use of electrically-operated business machines and communication equipment is constantly increasing. But the question is: How to provide for future electrical flexibility at *lowest cost*? Ceco meets the issue with its new Electro-Channel Open Web Steel Joists. Now, for the first time, steel joist construction can provide an integral underfloor raceway system allowing complete electrical flexibility. These joists have the same structural properties as regular Ceco Shortspan Open-Web Steel Joists. But in the Electro-Channel Joists the conventional top chord is replaced by a specially shaped hollow section which serves both as the top chord of the joist and as an underfloor distribution duct for electrical circuits. For complete information on Ceco Electro-Channel Steel Joist Construction, consult your nearest Ceco office. *Approved by the Underwriters' Laboratories for use with electrical header ducts and accessories as manufactured by General Electric, National Electric Products Corporation and Walker Bros.*





Wiring can be brought up through the floor at any point along the joists.

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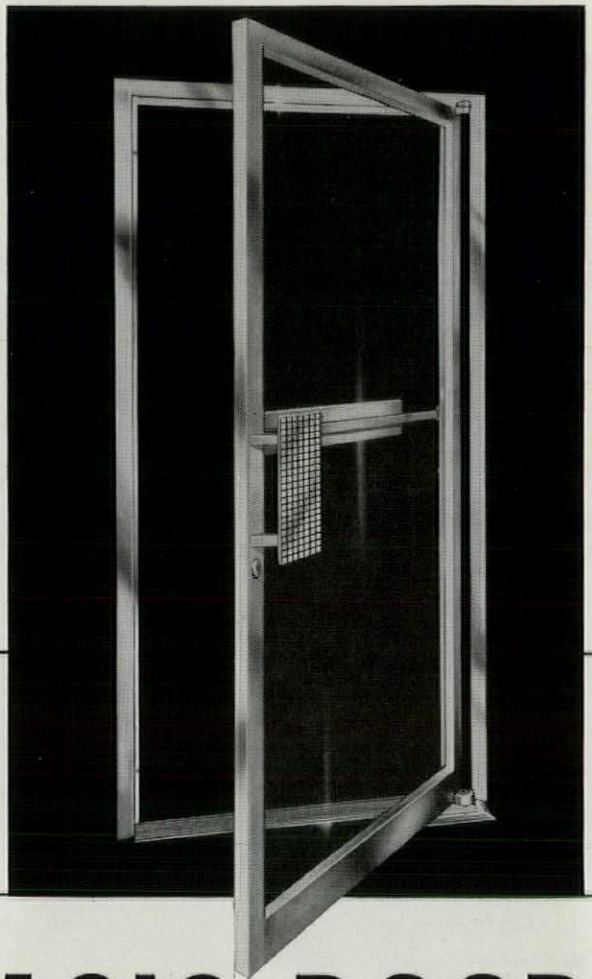
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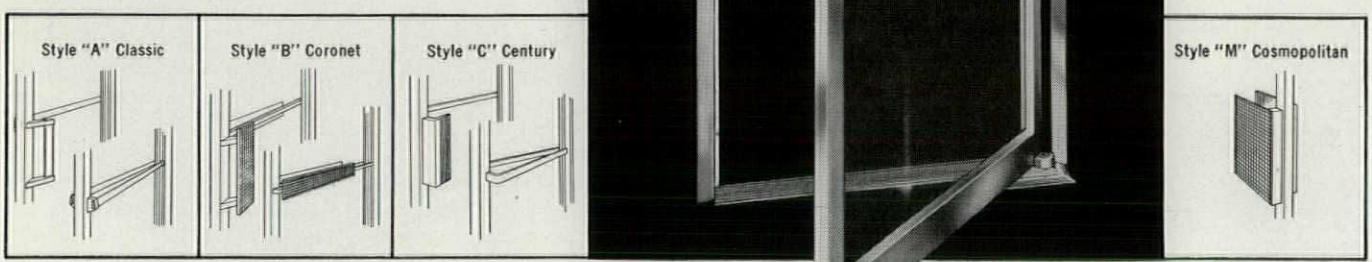
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4 basic push-pull groups—
2 with custom-design FACE PLATES

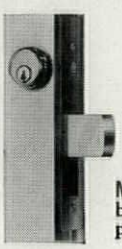
You can individualize the Kawneer narrow-stile door, with the new interchangeable hardware. Your own design or monogram in color, and in aluminum, wood or plastic is easily adapted to Styles B and M hardware. Never before has such versatile hardware been available with such ease of installation.



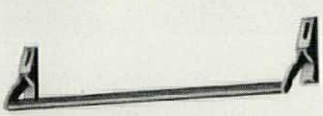


ONE BASIC DOOR

with hardware for every need



MS (maximum security) Deadbolt by Adams-Rite offers extra protection against forced entry.



Panic Device by Kawneer is designed with fewer parts, a bar shaped to fit the hand, and for lower cost.

The new Kawneer narrow-stile door has all the qualities of a "custom-made" product. Welded construction is used to insure maximum strength with slim, attractive lines. Deep etch alumiliting and no exposed screws assure continued good appearance. The wide selection of hardware provides great flexibility of design. See Sweet's $\frac{16a}{Kaw}$ for complete information.

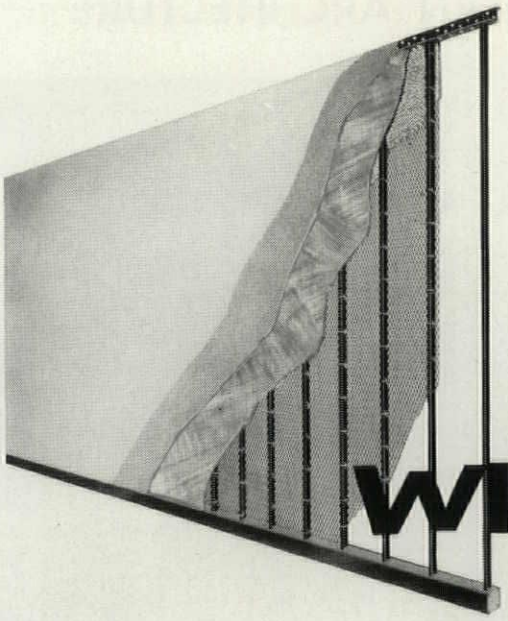
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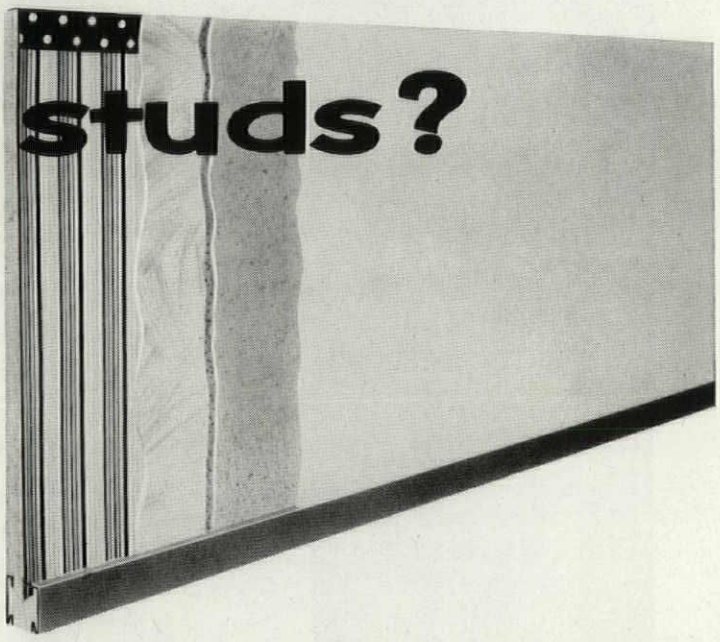
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Atlanta, Ga.	Brooklyn, N.Y.	Cambridge, Mass.	Cleveland, O.	Detroit, Mich.	Memphis, Tenn.	Oakland, Cal.	Portland, Ore.	Seattle, Wash.	Stamford, Conn.	Havana, Cuba
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WITH channel studs, the Gold Bond 2″ Solid Metal Lath and Plaster Partition System provides maximum fire protection, stability and low sound transmission. The system saves space . . . takes up less than half that of conventional wood-stud or masonry-constructed partitions. Metal ceiling runners, channel studs, base clips and base sections are designed to form a strong non-bearing interior partition up to 12′ high.

WITH or WITHOUT studs?



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REYNOLDS

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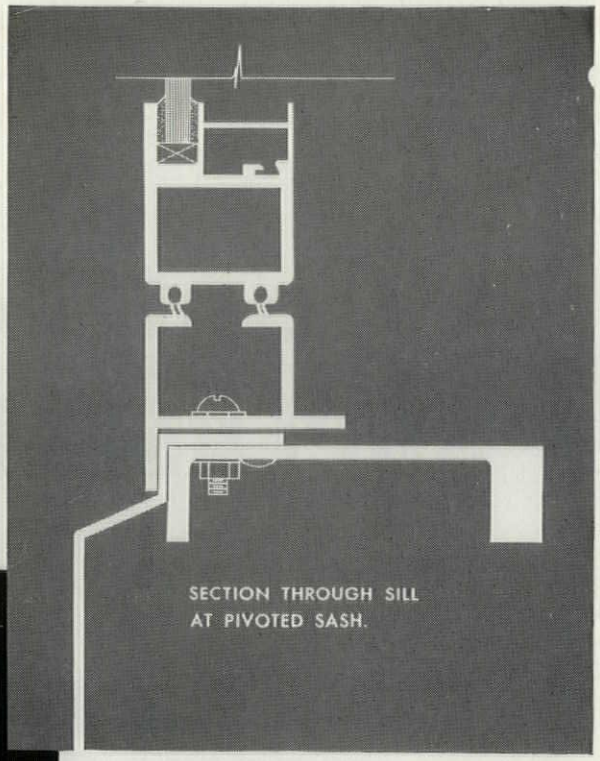
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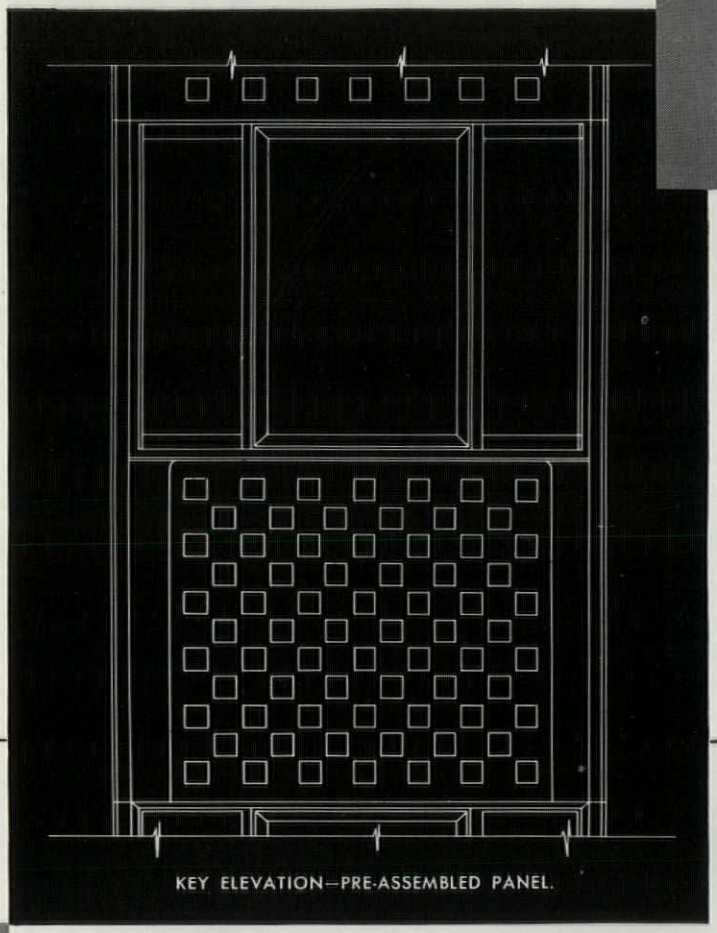
Architects:
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Exterior Wall Erectors:
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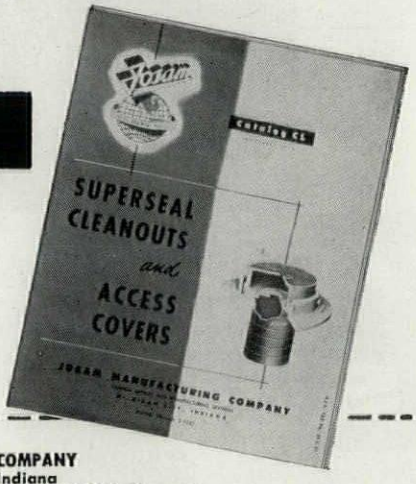
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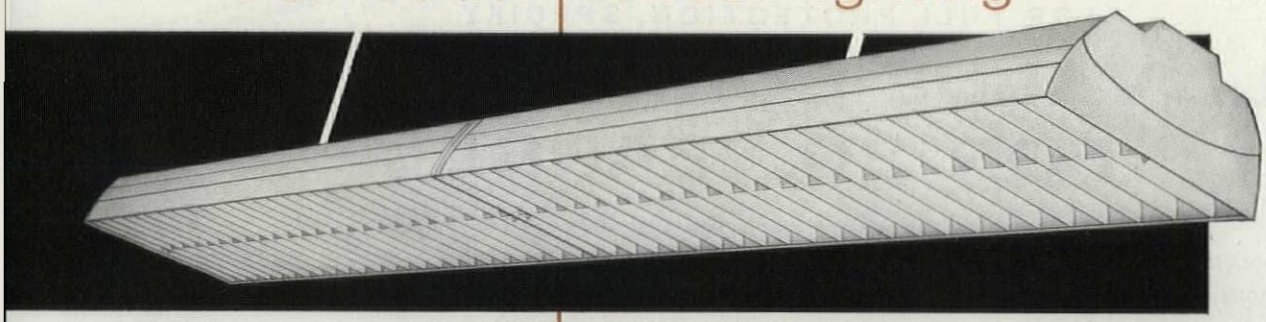
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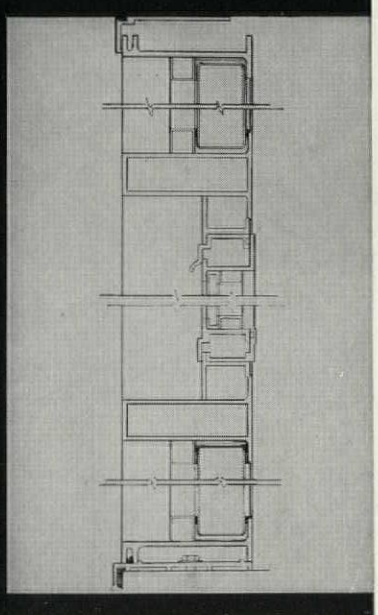
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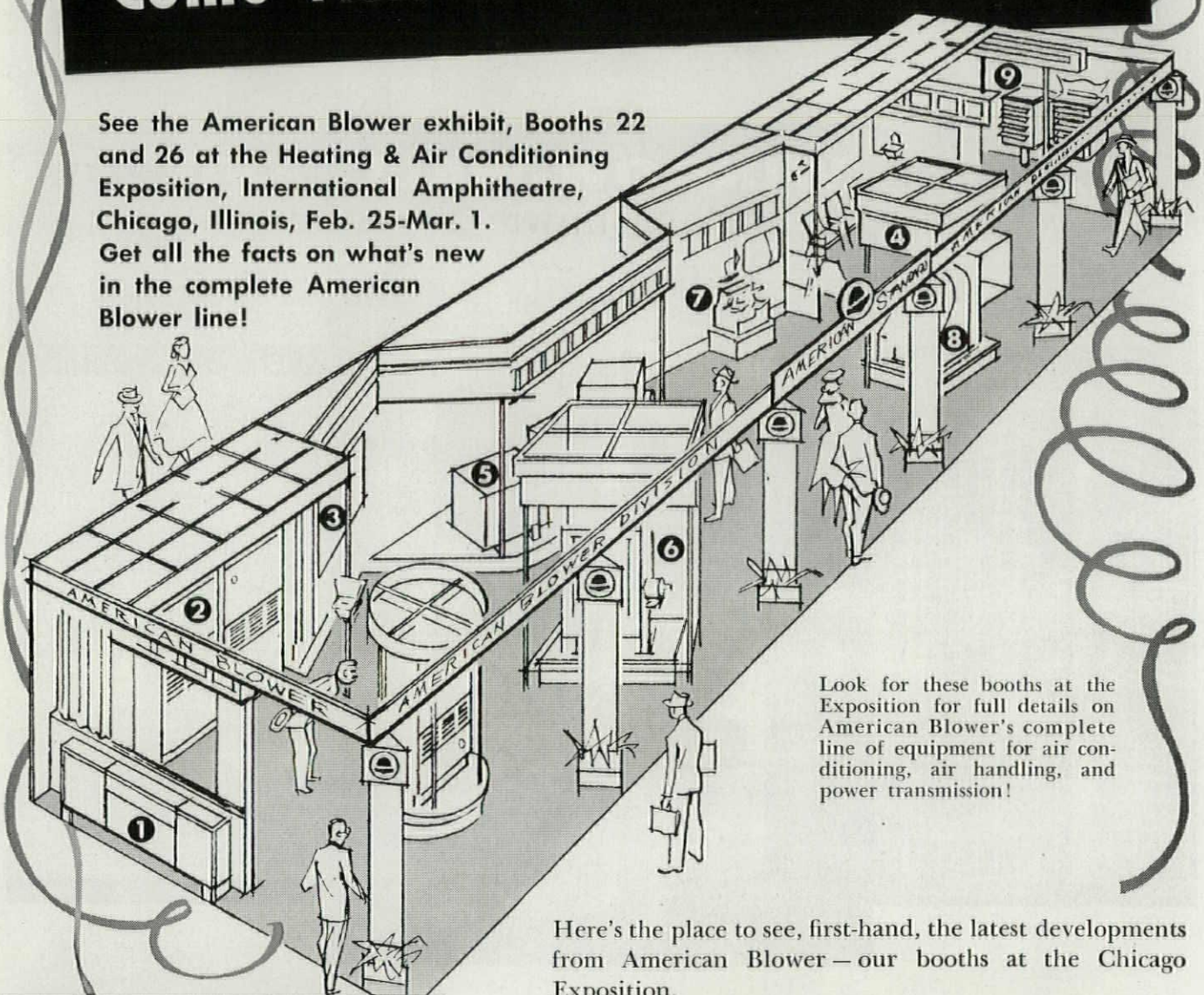


Jalousie | Econ-O-Wall | Econ-O-Ware Awning | WareRite and Ware Awning | Projected | Casements

Ware Laboratories, Inc., 3700 N.W. 25th St., Miami, Florida

Come visit us at the Exposition!

See the American Blower exhibit, Booths 22 and 26 at the Heating & Air Conditioning Exposition, International Amphitheatre, Chicago, Illinois, Feb. 25-Mar. 1. Get all the facts on what's new in the complete American Blower line!



Look for these booths at the Exposition for full details on American Blower's complete line of equipment for air conditioning, air handling, and power transmission!

Here are some of the things you'll see!

1. **Unit Conditioners**—designed to provide year-round air conditioning on an individual-room basis.
2. **American Blower Packaged Air Conditioners**—modern styling, engineered for industrial and commercial applications.
3. **Tonrac*** centrifugal refrigeration machines that maintain chilled-water temperature regardless of load.
4. **Ventura Fans**—propeller fans, with streamlined inlets, for general ventilation in commercial applications.
5. **Air-Conditioning Units**—components for central station air-conditioning systems.
6. **Sirocco High-Pressure Fans**, for high-velocity direct air-conditioning systems and industrial applications.
7. **GYROL® Fluid Drives** for smooth power and adjustable-speed control in a wide variety of industrial applications.
8. **Utility Sets**—self-contained fan units for general supply or exhaust where duct work is required.
9. **Unit Heaters**—horizontal and vertical models for use with steam or hot water, plus gas-fired heaters.

*Trademark

Here's the place to see, first-hand, the latest developments from American Blower—our booths at the Chicago Exposition.

You'll find a display on Tonrac, our new centrifugal refrigeration machine that installs on a single level. You'll see our completely new line of comfort-engineered packaged air conditioners, the latest Gyrol Fluid Drive, high-pressure fan, utility set, unit heater, and much, much more.

And there'll be motion pictures, moving displays, fact-filled literature—everything to make your visit interesting and informative. So make a note now to stop by! American Blower Division of American-Standard, Detroit 32, Michigan. In Canada: Canadian Sirocco products.

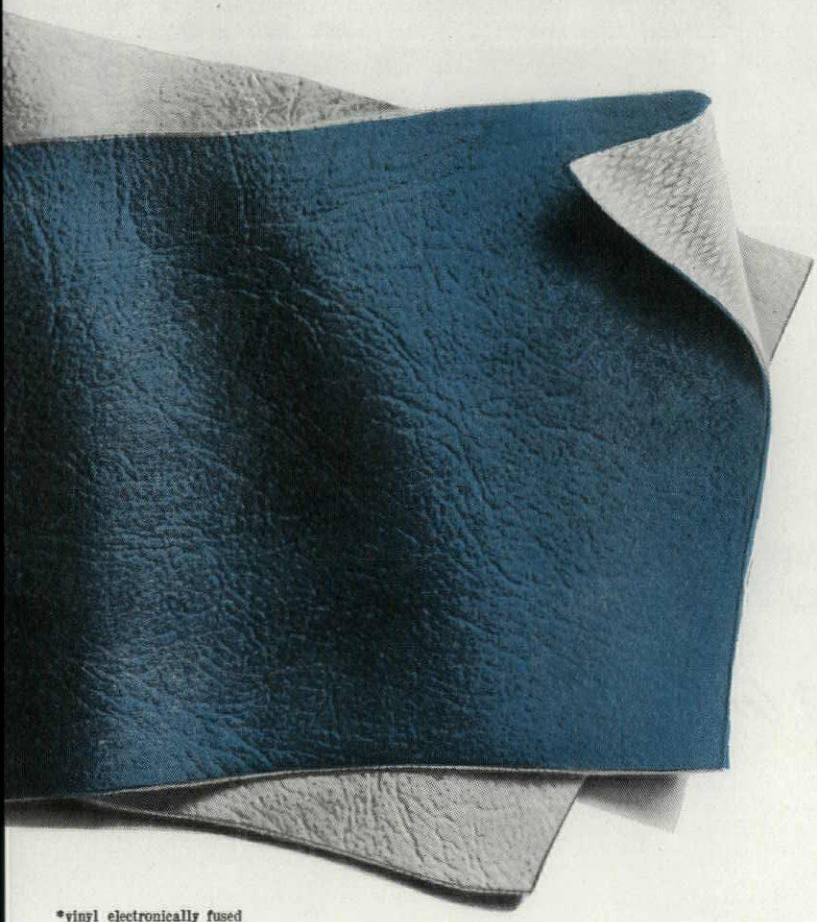
AMERICAN BLOWER

Division of AMERICAN-Standard



Walls "get it"... from people
people carrying unwieldy objects
people who wait and lean, rub, scuff and doodle
people passing, crowding, pushing day in and day out.
Be sure walls can "take it" all ways ... specify
L. E. Carpenter's new tough surface wall covering ...

V.E.F.* heavy-duty dado-wall



*vinyl electronically fused

Created by the makers of famous VICRTEX V.E.F.* FABRICS

Yes, walls really get it in schools, office buildings, hospitals, public buildings, institutions . . . wherever there are large concentrations of people.

But, walls can take it when protected with *new* tough surface, heavy-duty VEF DADO-WALL—made of durable vinyl electronically fused *in depth* on a strong woven fabric to form a smooth, almost impregnable, covering.

VEF DADO-WALL resists abrasion, scuffs, digs—won't peel, crack or chip. L. E. Carpenter's famous VEF technique and *extra*-deep vinyl surface have produced a wall covering that can pass the most severe scuff and wear tests. Like all VEF fabrics, DADO-WALL is mildew and sound resistant . . . will NEVER shrink-at-the-seams, NEVER fade or discolor.

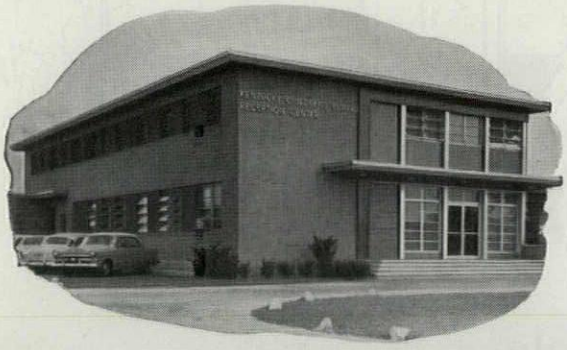
The handsome two-toned effects and solid colors are comfortable . . . have been selected to *meet color therapy standards'*

In design . . . performance . . . maintenance, L. E. Carpenter's *new* tough surface heavy-duty VEF DADO-WALL can take it all ways!

Write TODAY for samples and prices.

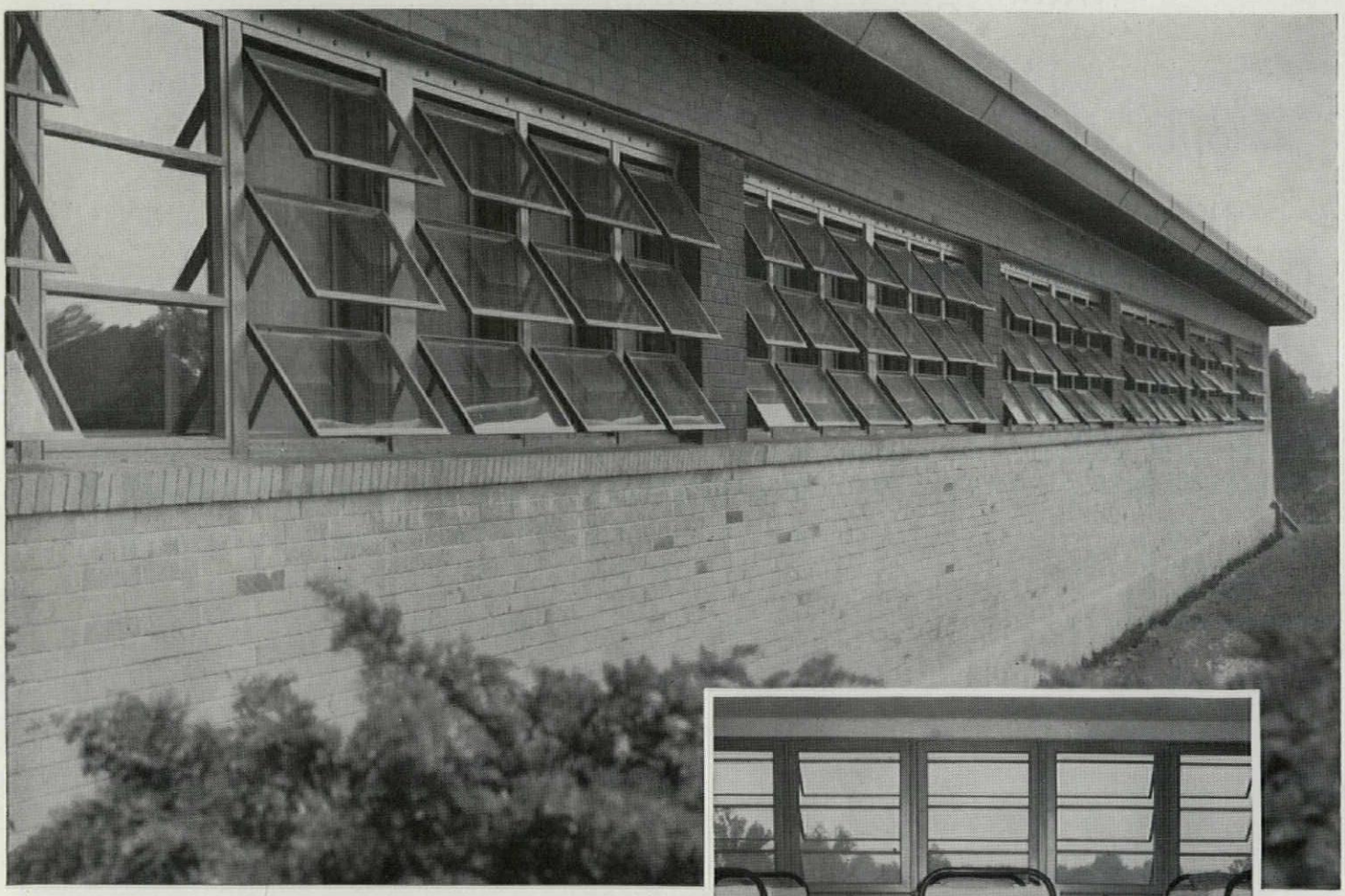
L. E. CARPENTER & COMPANY, INC.
Empire State Building, New York 1 • LOngacre 4-0080
Mills: Wharton, New Jersey

another VICRTEX V.E.F ORIGINAL



Kentucky Children's Bureau Reception Center, Lyndon, Kentucky. Arrasmith and Tyler, architects; Rostetter Construction Co., contractor.

Fresh





Truscon Steel Intermediate Projected Windows. Tamper-proof mechanism can be operated by authorized personnel only. Interior view shows detention screens installed.

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

air and sunlight...

PLUS RESTRAINT

Look at that sweep of fresh air and sunlight designed into the new Kentucky Children's Bureau. Certainly no appearance of detention. But, it's there!

The windows are Truscon Steel Intermediate Louver, fitted with detention screens. Easy-acting, tilt-out ventilators operate simultaneously to provide precisely controlled ventilation and close snugly to provide positive weather protection. In detention applications, degree of vent opening can be controlled by authorized personnel only.

While detention is but one use for this versatile intermediate window, it is an important application. If you expect to be dealing with problems involving specification of psychiatric or detention windows, it will pay you to talk to Truscon. It's taken us forty years of specialized experience, but we've got the answers in this highly technical field.

And, Truscon has a knack of designing psychiatric and detention windows that conceal or minimize all indications of enforced restraint. That's important. As is careful engineering to protect patients against self-injury and to prevent escape.

Check with your Truscon district office for specialized help, or send coupon for complete window catalog.

STEEL

and Steel Products

MORE TRUSCON PRODUCTS FOR INSTITUTIONAL SAFETY...



Truscon "O-T"® Steel Joists make floors and roofs fire-resistant, strong, lightweight. Fire-resistant ceilings of Truscon Metal Lath and plaster can be suspended from joists. Truscon "O-T" Steel Joists bear the Seal of Approval of the Steel Joist Institute. That's your assurance of quality construction, dependable performance. Send coupon for facts.



Truscon Steel Doors are as handsome as they are functional. Dependable operation assured even in high traffic locations because steel won't warp, swell, shrink or splinter. Furnished complete with hardware and frames. Easiest of all to install. Economical. New booklet tells all. Send coupon.

REPUBLIC STEEL CORPORATION
Dept. C-3018
3186 East 45th Street
Cleveland 27, Ohio

I'm interested in more facts on these products of Republic's Truscon Steel Division:

☐ Psychiatric and Detention Windows ☐ Steel Doors
☐ Truscon "O-T" Steel Joists

Name_____ Title_____

Firm_____

Address_____

City_____ Zone____ State_____

Another Loxit First!

LOXIT® MIRAWAL® PORCELOX

Porcelain Steel

CHALKBOARDS



in Standard Heights and

UP TO 16 FT. LONG

in one piece

and in Eight Attractive School Colors

LOXIT MIRAWAL PORCELOX Porcelain Steel Chalkboards are produced in single, straight-line continuous electric furnaces to make the long lengths possible. The vitreous porcelain surface is fused to the nickeled steel sheet at a temperature of 1600°F, making it unexcelled as a porcelainized metal coating for all chalkboard uses.

Check these advantages!

1. TWO TYPES AVAILABLE
LOX-85 NU-VICTORY LOXIT MIRAWAL PORCELOX — a light gauge porcelain steel chalkboard face sheet laminated to 3/8" "structo-core" with a porcelainized steel backing. Available up to 4' x 16'—in one piece. LOX-86 NU-IMPERIAL LOXIT MIRAWAL PORCELOX — a light gauge porcelain steel chalkboard face sheet laminated to 1/4" exterior grade plywood with a rust resistant metal backing. Available up to 4' x 12'—in one piece.

2. DURABLE AND PERMANENT
The vitreous inorganic porcelain surface will not craze or crack. Shrinkage and expansion is negligible. Will take magnets.

3. SCRATCH AND IMPACT RESISTANT
The flint-hard, glass-smooth porcelain surface provides high resistance against scratching and marring. Tests at least 6.5 on scale of Hardness of Minerals.

4. SANITARY AND EASY TO CLEAN
The glass-hard porcelain surface is impervious to acids, odors, grease and solvents. Easily cleaned with a damp cloth.

5. FIREPROOF CONSTRUCTION
LOXIT MIRAWAL PORCELOX chalkboards are fireproof. Will not support combustion.

6. LIGHT WEIGHT—SIMPLE TO INSTALL
The thinness of gauge which is adequate for all chalkboard requirements makes them light in weight, simple to install and easy to handle during erection.

7. EIGHT BEAUTIFUL FADEPROOF SCHOOL COLORS
Rite Spring Green, Rite Dark Green, Rite Gray, Rite Tan, Rite Coral, Rite Blue, Rite White (Ivory), and Rite Black.

8. MAINTENANCE FREE—ECONOMICAL
They are maintenance free except for cleaning. Will meet any reasonable budget both in the construction of the building and in its maintenance.

9. TRIMMED
Available completely trimmed ready to set in place—with or without the use of the Loxit Miracle Adjustable Chalkboard Setting System.

Write today for literature and sample panel.

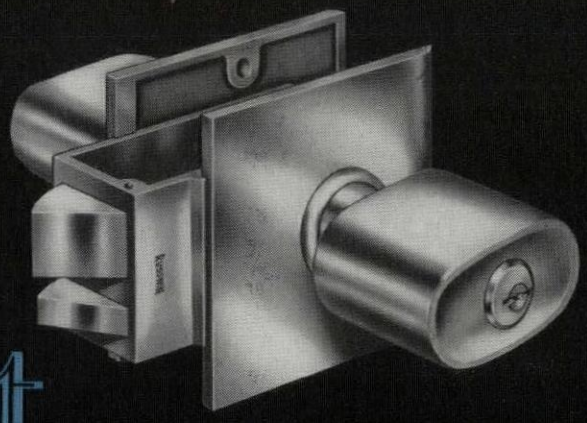
LOXIT SYSTEMS, INC.

1217 W. WASHINGTON BLVD., CHICAGO 7, ILLINOIS

Copyright 1957, Loxit Systems, Inc.

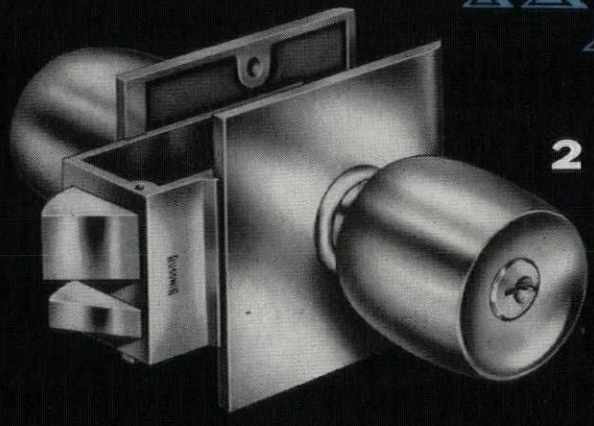
LOXIT SYSTEMS INC

AERO DESIGN in cast brass,
bronze or aluminum.
Diameters: Knobs, 2-3/32" x 1¾".
Escutcheons, 3⅛" x 3¼".



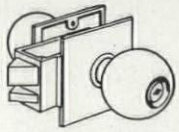
Client Appeal

2 new uniloc designs

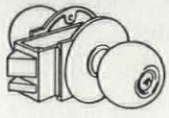


TURBO DESIGN in cast brass,
bronze or aluminum.
Diameters: Knobs, 2-1/32"
Escutcheons, 3⅛" x 3¼".

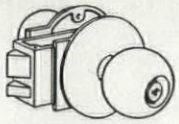
NEW STYLING plus the unique, unit-construction of Unilocs now offer you an exceptional opportunity to emphasize the extra care given to details in your planning. Unilocs are not ordinary locks in any sense of the word. Their conception is based upon the complete assembly of lock parts at the factory so that no disassembly is required for installation or removal. Thus all cramping or binding of parts is avoided—smooth action assured—and wear reduced to a negligible factor. Finishes available include: dull brass, polished brass, dull bronze, bright chromium, dull chromium and dull aluminum. Ask your Russwin representative to show you the new Turbo and Aero designs. Be sure to check and compare costs. Russell & Erwin Division, The American Hardware Corporation, New Britain, Conn.



MODERA DESIGN

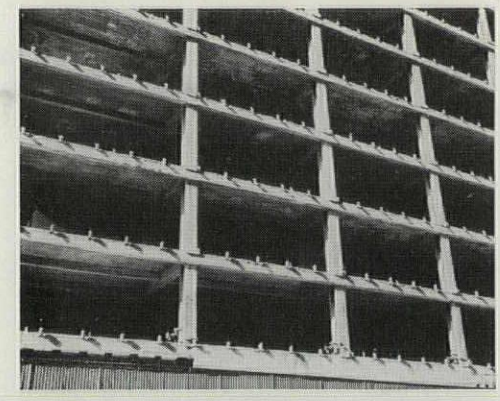


BRISTOL DESIGN



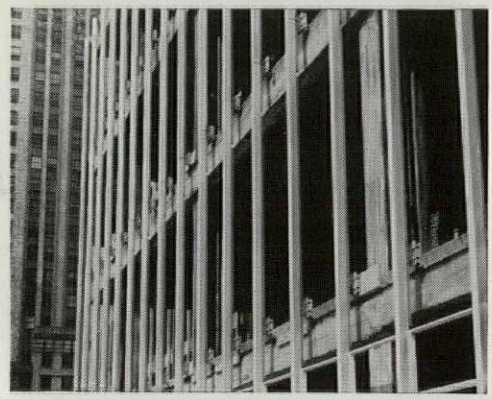
MONO DESIGN

RUSSWIN
UNILOCS
A symphony in lock making



CONSTRUCTION IS FAST, SIMPLE:

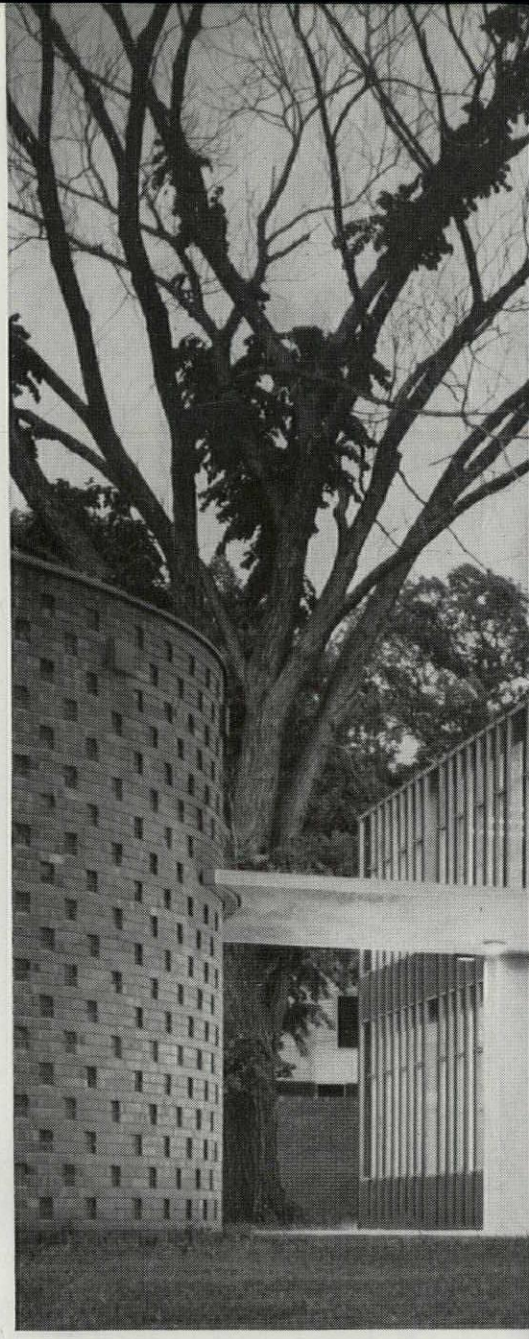
First step in the erection of a Lupton Curtain Wall System is the bolting of galvanized steel clips to angle clips fastened to the floor slab or spandrel beam. Angle clips are accurately aligned and welded to the structural frame before concrete is poured.



Vertical mullions of extruded aluminum that act as the "organizing element" of the wall are bolted to the galvanized clips. Slots in the angle clips and galvanized clips allow extremely accurate positioning of the mullions, regardless of structural irregularities.



Here experienced Lupton crew men insert wall units between vertical mullions from *inside* the building, without scaffolding or special hoisting equipment. (They are designed to be installed from either inside *or* out.) Single Lupton contract provides single responsibility for manufacture and installation of curtain wall system.



. . . You Get LOW COST and BEAUTY with the

Freedom of design, speedy construction, minimum maintenance —these are the major advantages of this curtain wall system.

Here is a revolutionary wall system that offers both you and your client unparalleled advantages.

Consider, for instance, the variety in design you can achieve merely by varying the size and location of glazed and non-glazed areas—or the type of fenestration—or the material, color and texture of opaque areas.

Consider the saving in time the Lupton System makes possible. Both panels and windows are factory-assembled—go up in record time. Lupton-trained crews install Lupton-engineered and Lupton-assembled units under a single contract.

Consider the saving in money you pass on to



Memorial Chapel and Charles Medbury Hall, College of the Bible, Drake University, Des Moines, Iowa
Architects—Eero Saarinen & Associates, Bloomfield Hills, Mich. Contractor—Fane F. Vawter Co., Des Moines, Iowa

LUPTON ALUMINUM CURTAIN WALL SYSTEM

your client. Lower first costs, lower maintenance costs. And curtain walls—one-third as thick as conventional masonry—provide a *plus*-dividend in additional square feet on *every* floor.

Get Lupton into your design picture *early*. You'll find complete specifications listed in Sweet's Architectural File 3a/FLy. To locate your closest representative, look for the name LUPTON in the Yellow Pages under Windows and Sash—Metal. Or write or wire.

LUPTON

ALUMINUM CURTAIN WALLS AND METAL WINDOWS

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Main Office and Plant:

MICHAEL FLYNN MANUFACTURING COMPANY

700 E. Godfrey Avenue, Phila. 24, Pa.



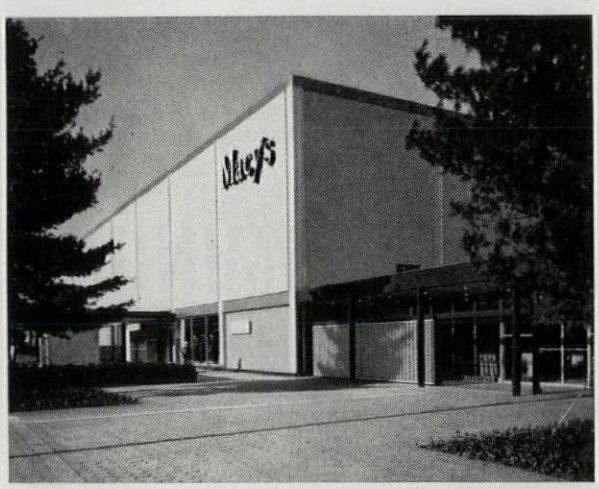
NEW MACY STORE IS FOCAL POINT OF SHOPPING CENTER SHOWPLACE

Everything from barbecue grills to Paris fashions are on sale at Macy's newest store at Roosevelt Field Shopping Center, Long Island. Called the largest suburban department store in the East, the new Macy's is the main unit in the ultra-modern, 130-acre center built on the site of the former airfield.

The new store is a steel-framed glass-and-brick structure three stories high with 343,000 sq ft of shopping-floor space. All three floors are connected by escalators. The Macy store, together with 109 others, comprise the shopping center, which is ringed by a parking area large enough for 11,000 cars.

The floors of this newest Macy's were built with Bethlehem Open-Web Steel Joists. Steel joists help form strong, sturdy floors that won't warp or sag, helping to hold future maintenance costs to a minimum. They were inexpensive to install for they arrived at the job site fully fabricated, ready for immediate placing; only field-welding was necessary to secure them permanently. Ducts and wiring were run right through the open webs, simplifying the installation of recessed lighting and air conditioning.

Bethlehem Open-Web Steel Joists, in combination with floor slab and poured ceiling, provide a type of construction that is fire-resistant for up to four hours, depending upon the thickness of the slab and the type of plaster used.

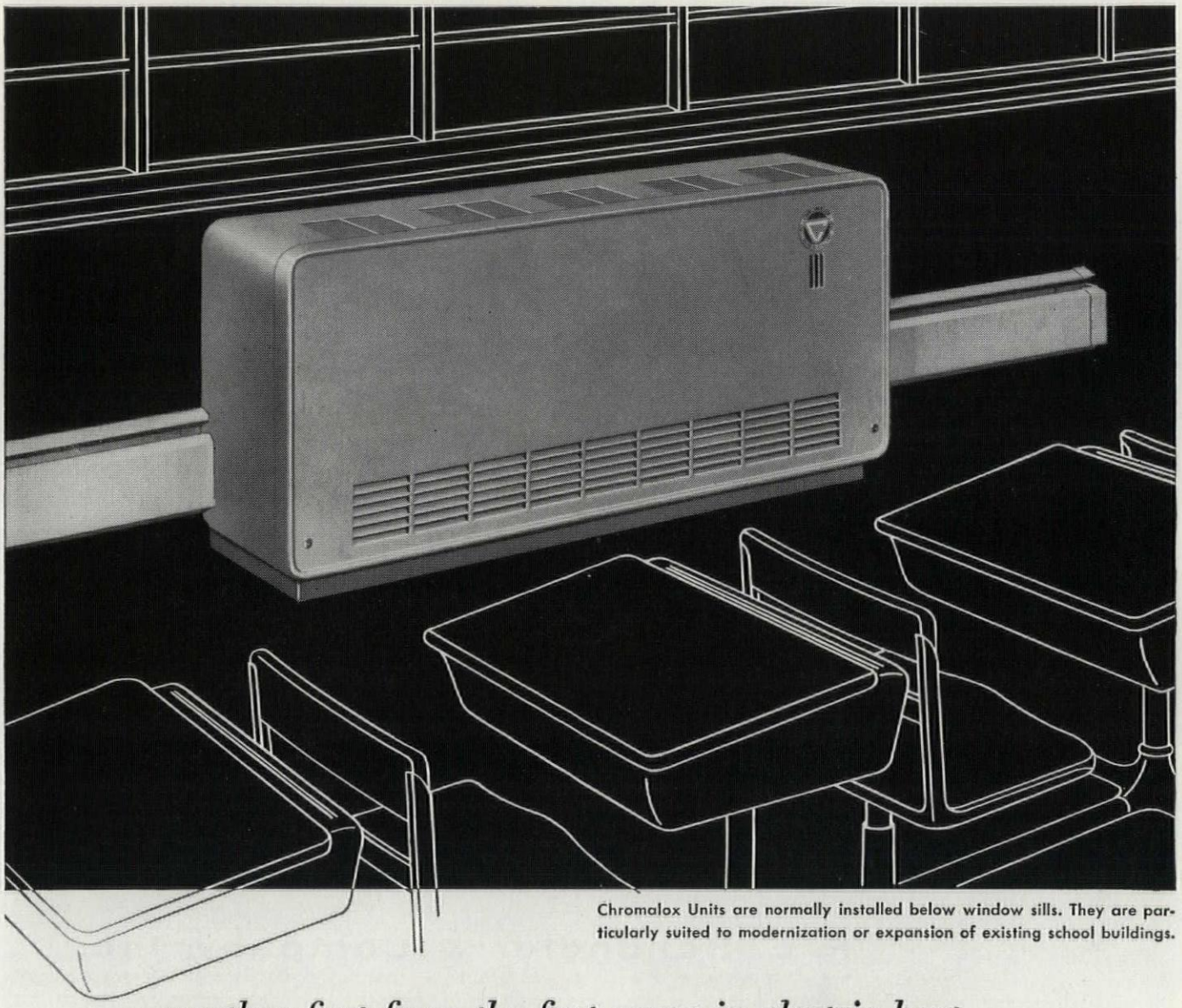


The new Macy's department store at Roosevelt Field Shopping Center, Long Island. *Architects:* Skidmore, Owings & Merrill. *Structural Engineer:* Severud-Elstad-Krueger. *General Contractor:* Turner Construction Company.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM OPEN-WEB STEEL JOISTS

BETHLEHEM STEEL



Chromalox Units are normally installed below window sills. They are particularly suited to modernization or expansion of existing school buildings.

another first from the first name in electric heat...

CHROMALOX ALL-ELECTRIC UNIT

for Heating, Ventilating and Natural Cooling

This new and versatile Electric Unit is specifically engineered for fast response to the unusual thermal requirements of classrooms, as well as auditoriums, gymnasiums, cafeterias and libraries of schools. It is part of a line of famous products for *heating* modern schools with the modern fuel—electricity—and for ventilating and cooling with controlled outdoor air intake.

The Chromalox Electric Unit is available with integral room thermostat, damper controls, and step controls to modulate heat output. Pneumatic or electronic control systems can be factory- or field-installed.

This All-Electric Unit leads the way to impressive savings in financing and construction. Only a few wires connect it. No need for boiler rooms, boilers, piping, valves or chimneys. And maintenance costs, too, are considerably less than with conventional systems.

Chromalox Electric Baseboards go hand-in-hand with these new All-Electric Units to maintain reduced night temperatures and to eliminate objectionable window downdrafts.

Chromalox All-Electric Units carry real quality features such as direct-motor drive, and heat generated at the point of use by Chromalox metal sheath elements, operating on the draw-through principle. They meet all state ventilating codes, are functional in design. Air capacities from 500 to 1250 CFM: heating capacities from 2700 to 61,500 BTU/HR. For further information write for "Heating Schools Electrically" and Bulletin 980.

C-2201

HEAT BETTER... ELECTRICALLY

Edwin L. Wiegand Company

COMMERCIAL HEATING DIVISION

7800 THOMAS BOULEVARD · PITTSBURGH 8, PENNA.

Designing roof decks? Here's

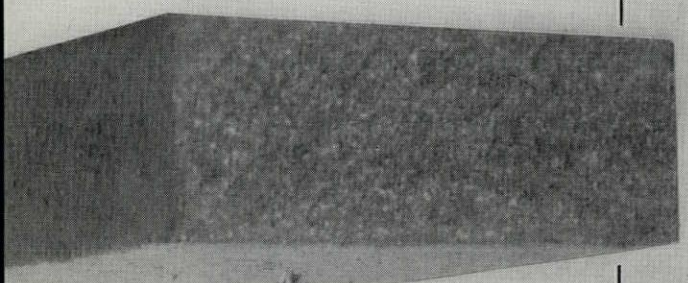
Only **Fesco Roof Deck Insulation Board** rates so high on **every** important count. No other board at any price matches this **balanced combination** of properties. This is because Fesco Board was developed specifically for roof deck insulation. Write for detailed specifications.

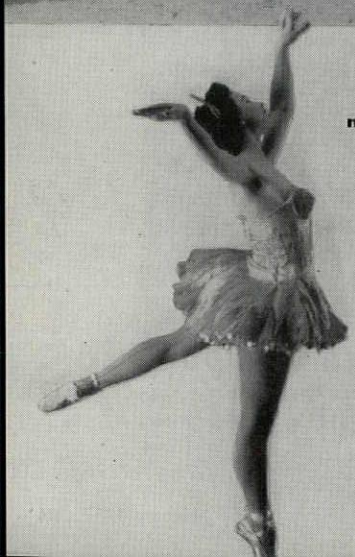
F. E. Schundler & Company, Inc.

504 RAILROAD STREET • JOLIET, ILLINOIS

RATED FIREPROOF MATERIALS, ACOUSTICAL AND INSULATING

Developers and producers of distinguished, incombustible mineral products including Ebbtone Acoustical Tile, Fesco Insulation Board, Coralux Acoustical Plaster, Coralux Perlite Aggregates, Mica Pellet Vermiculite, High Temperature Insulating Blocks and Insulating Cement.

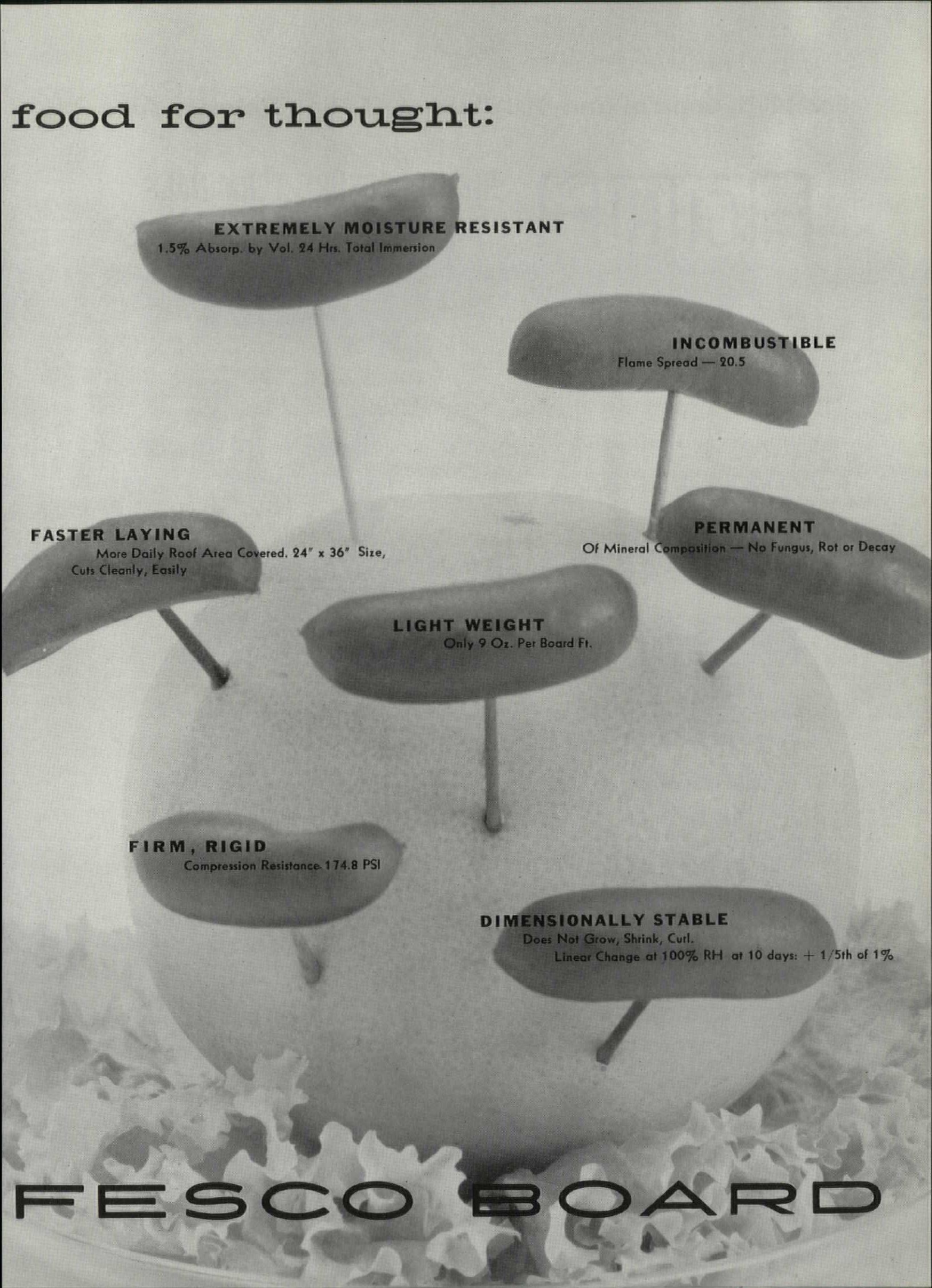




Cellular structure of Fesco blocks out moisture, thermal conductance, creates compressive strength.



The answer to better roof decks is

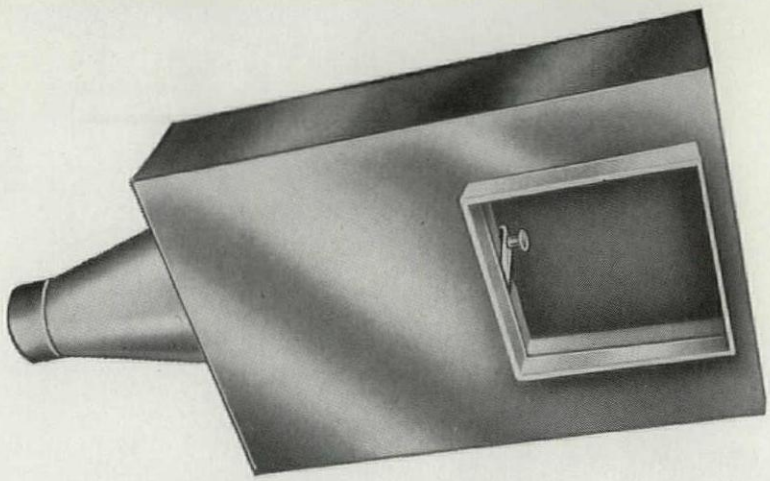

food for thought:
EXTREMELY MOISTURE RESISTANT
1.5% Absorp. by Vol. 24 Hrs. Total Immersion
INCOMBUSTIBLE
Flame Spread — 20.5
FASTER LAYING
More Daily Roof Area Covered. 24" x 36" Size,
Cuts Cleanly, Easily
PERMANENT
Of Mineral Composition — No Fungus, Rot or Decay
LIGHT WEIGHT
Only 9 Oz. Per Board Ft.
FIRM, RIGID
Compression Resistance 174.8 PSI
DIMENSIONALLY STABLE
Does Not Grow, Shrink, Curl.
Linear Change at 100% RH at 10 days: + 1/5th of 1%
FESCO BOARD

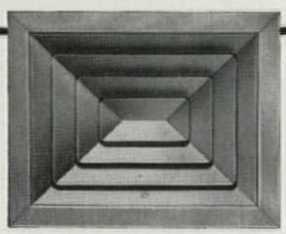
For 100% Control and Distribution of High Velocity Air...

AGITAIR® HIGH PRESSURE TERMINALS ...DISTINCTIVE AIR DIFFUSERS

AGITAIR High Pressure Terminals and noise attenuation boxes are the development of Air Devices Inc. engineers after years of research, laboratory and field work in the control and distribution of air through high velocity ducts.

These AGITAIR High Pressure Terminals combine all the practical operating features demanded by engineers to assure 100% control of high velocity air. AGITAIR High Pressure Terminals are available in a variety of types and styles.





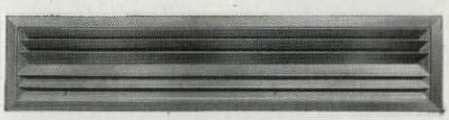
"RC"
PATTERNS UNLIMITED

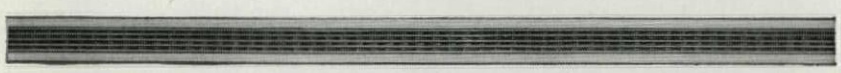
CORRECT AIR DISTRIBUTION

To assure noiseless, draftless distribution of air from AGITAIR High Pressure Terminals, there is a complete line of AGITAIR distinctive diffusers that can be employed to meet any job requirement.

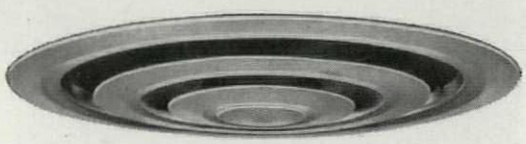
Separate catalogs are available containing informative, useful engineering data for each type AGITAIR diffuser —Type RC series (Square, Rectangular and Continuous) — Stripline (Slot Type) and Circular (Adjustable and Non-Adjustable.) Ask your AGITAIR representative for your copy of these catalogs or write direct to Air Devices Inc.

"RC" CONTINUOUS
(1 - 2 way blows)





STRIPLINE — SLOT TYPE
(1 - 2 way blows)



CIRCULAR
ADJUSTABLE & NON-ADJUSTABLE

Write for Catalog HP100

AIR DEVICES INC.

185 MADISON AVENUE, NEW YORK 16, N. Y.

AIR DIFFUSERS • FILTERS • EXHAUSTERS

Again in 1957.... more school doors will swing on STANLEY hinges than on *any other kind!*

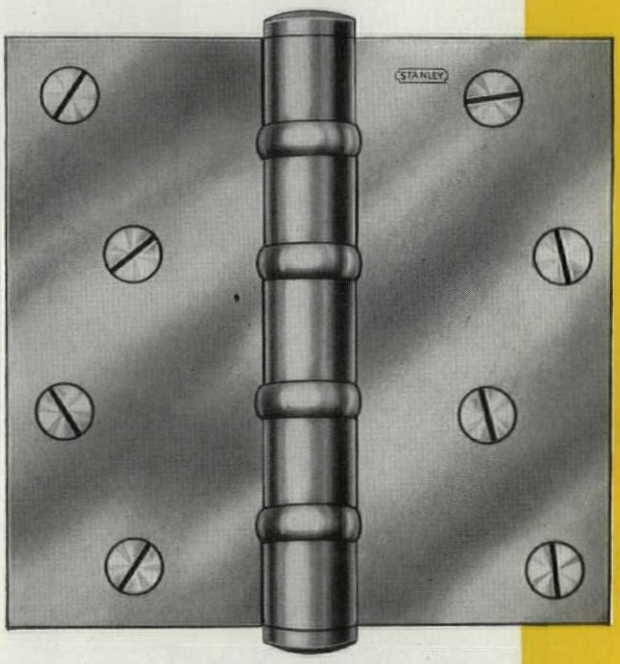
All architects know that school doors take a great deal of abuse. Stanley knows it, too, and makes hinges especially designed to stand up under such mistreatment.

As a result, more exterior doors today swing on Stanley's full-jeweled ball bearing hinges with their set screws that guarantee non-removal of hinge pins when doors are closed.

Stanley leads in interior hinges, too, for doors of both average and high frequency uses.

All types of Stanley Ball-Bearing Hinges are available in wrought bronze, brass, aluminum, steel or stainless steel, in all standard sizes and finishes.

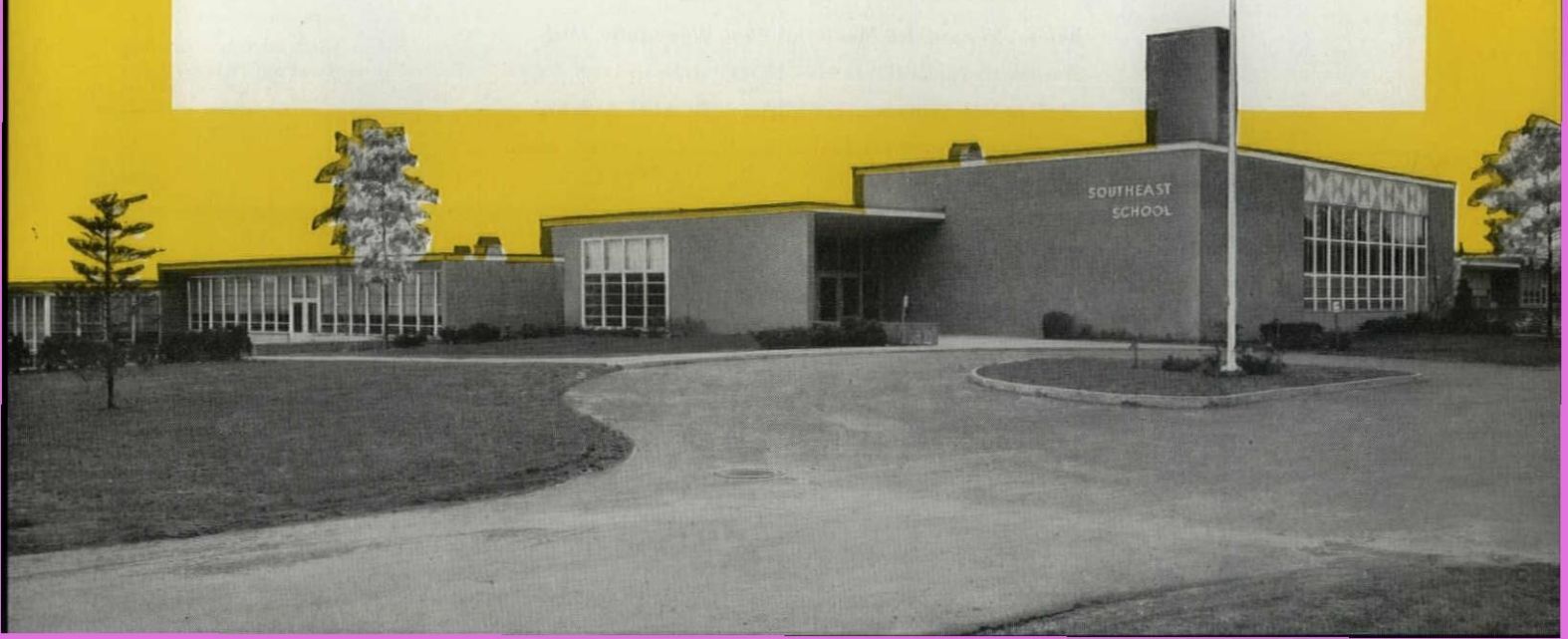
For the full story, send for Stanley's informative Hinge Guide. Write Stanley Hardware, Division of The Stanley Works, 782 Lake St., New Britain, Conn.



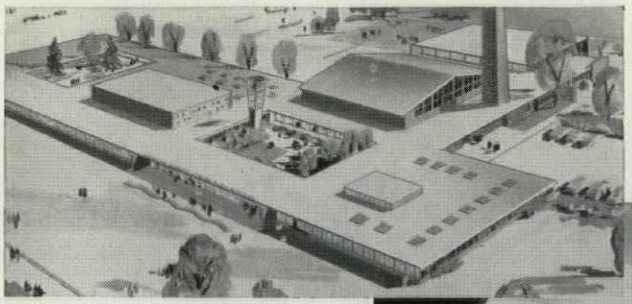
Type BB 181, size 5" x 4½"

STANLEY

REMEMBER THREE HINGES TO A DOOR



POWERS Control



One of 8 Wyandotte schools using Powers Temperature Control.

"A School Without Study Halls or Homework; each class period is used partly for study, and the ideal is to make the work so engrossing for students that they will pursue it voluntarily."

The building surrounds two courts or patios, one of which is shown at right. It has sheltered tables with benches, planting beds and a sundial.

The old bell served the previous Lincoln Junior High School for 50 years.



ABRAHAM LINCOLN JUNIOR HIGH SCHOOL, Wyandotte, Mich.

Architects and Engineers: EBERLE M. SMITH ASSOCIATES, Inc., Detroit

Heating Contractor: L. L. McCONACHIE COMPANY, Detroit







Right: Powers Recording Psychrometer provides chart records of dry bulb and wet bulb temperatures.





***Below:* Wyandotte Memorial Pool, Wyandotte, Mich.**

Architect: ROBERT L. SVOBODA, Detroit

Mechanical Engineer: THOMAS J. BLACK, Detroit

Heating Contractor: GLANZ & KILLIAN, Detroit, Mich.

(C-80)

...used in this school "planned for effective learning"



Among its many noteworthy features the Abraham Lincoln Junior High School has FLEXIBILITY... to permit altering classroom size to accommodate future curriculum changes. Classrooms have non-load-bearing partitions which can be relocated. Heating and ventilating is supplied from prefabricated acoustical radiant ceiling panels which can be rearranged to permit future changes.

Versatility of Powers Temperature Control is demonstrated in this outstanding school and the natatorium shown below.

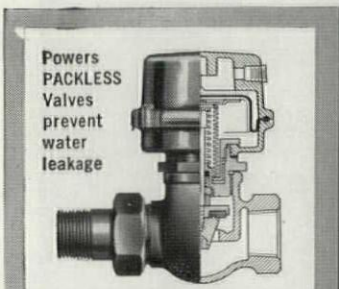
The heating and ventilating system is divided into six zones depending on function of each area. The Powers control system permits normal daytime operation of any zone or zones while the balance of the building remains on economical night control.

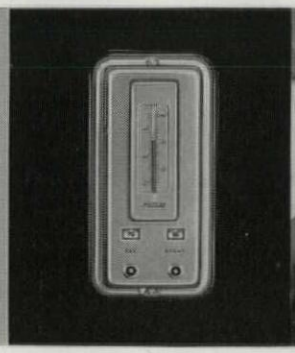
Individual Room Control—Each room is equipped with a Powers Day-Night thermostat which modulates a Powers *packless* valve on the ceiling radiant heating coil. A Powers MASTROL system regulates the temperature of the forced hot water supplied to the ceiling coils. The classroom ceilings consist of perforated snap-on metal pans suspended from radiant heat coils above which a glass fiber blanket provides insulation and acoustical absorption. The space between is an air plenum from which ventilating air is forced through the ceiling perforations into the classrooms.

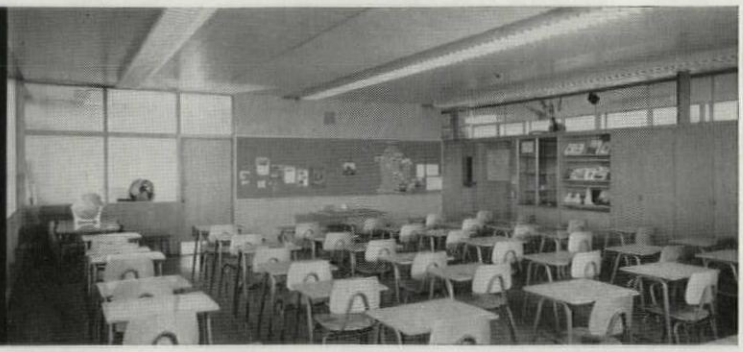
Powers PACKLESS Valves a Must—They prevent leakage of water on ceiling and eliminate packing maintenance. Because they have no packing nut or gland to be tightened, oiled or adjusted, there is no binding of valve stem and they give better control.

Ventilation is regulated by Powers controlled fan units located throughout the building.

If You Are Planning a New School or remodeling an old one, ask your architect or engineer to include a Powers Quality system of temperature control. You will help insure utmost comfort and lowest upkeep cost.







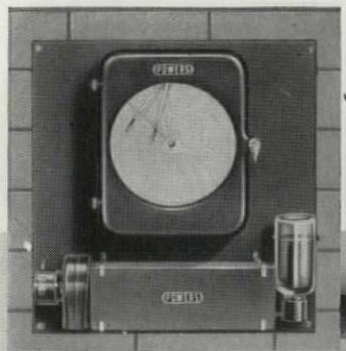
For further information contact our nearest office

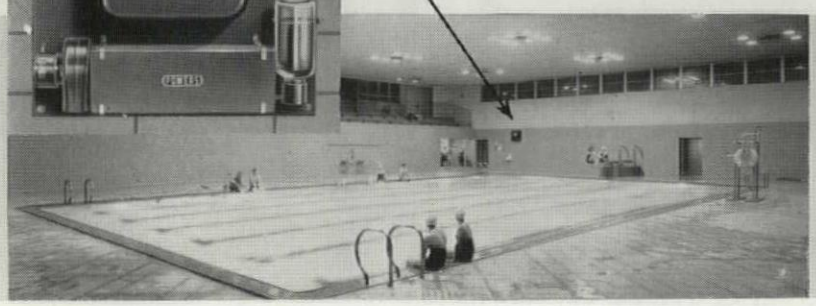
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POWERS CONTROL

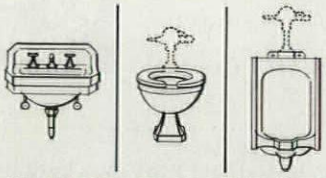




Unique Indoor-Outdoor Pool—was built by the City of Wyandotte adjacent to the Lincoln School. Both share its cost and year 'round use, resulting in big savings. Note the large sliding glass doors opening in summer to outdoor sundeck. Heating and ventilating and pool water temperatures are thermostatically regulated by a POWERS CONTROL SYSTEM.



As you consider the needs of the nation's schools



Eljer fixtures are made in cast iron, formed steel, and vitreous china. Consult Sweet's Architectural File, or write for complete illustrated catalog and roughing-in book. Eljer Division of The Murray Corporation of America, Three Gateway Center, Pittsburgh 22, Pennsylvania.

—remember that Eljer offers a complete selection of plumbing fixtures and brass goods specifically designed for school use. Look to Eljer for the matchless styling and proved utility you demand for your buildings.

ELJER

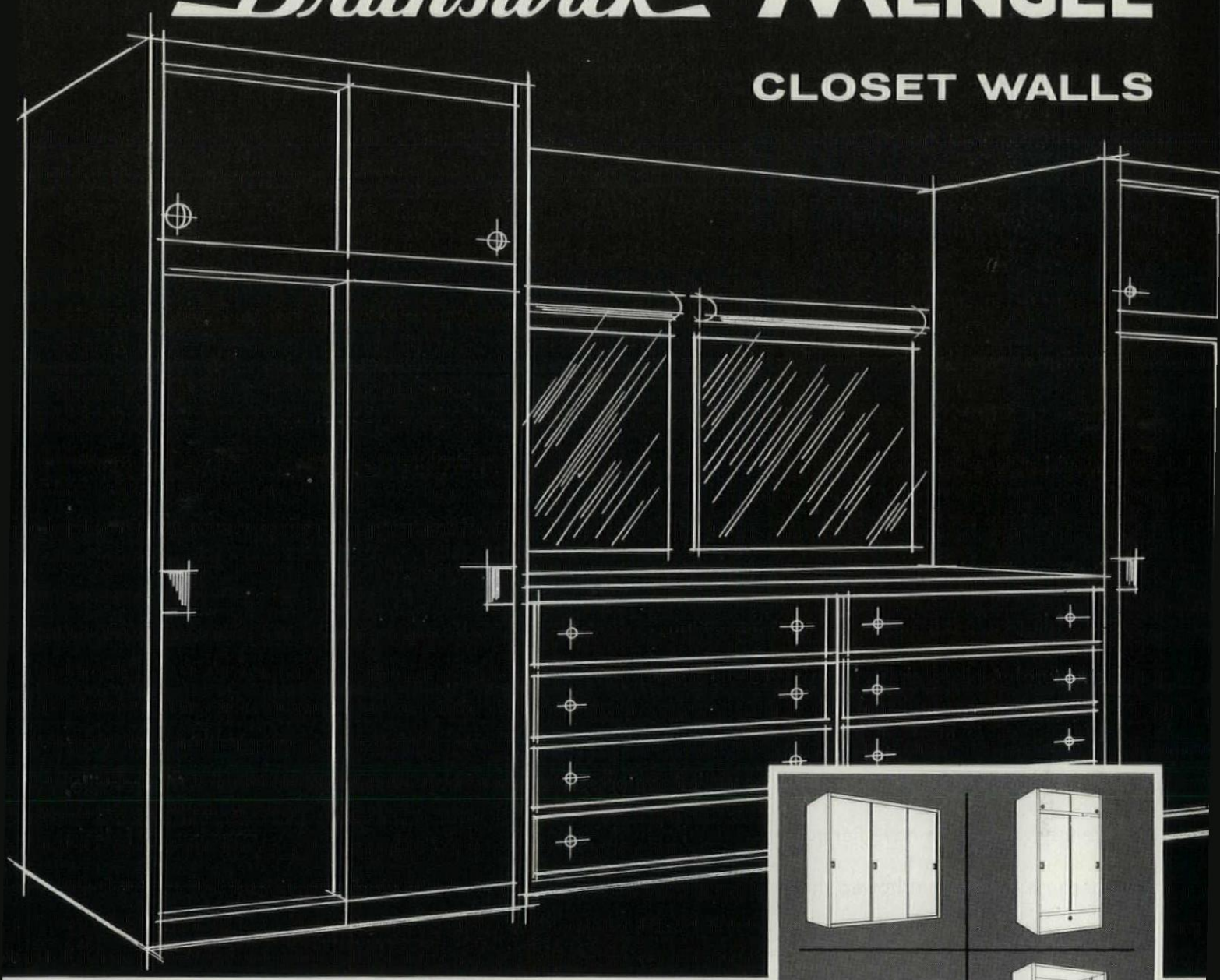
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WOULD YOU SPEND $400 MORE ON A SCHOOL BUILDING TO MAKE A CASH SAVING OF $30,000?



to the school board in a certain small community the answer was not so obvious as it appears, since, in the beginning, they saw only the first part of the question. They were considering costs on the erection of a new school. One proposal, only $400 higher than the low bid, called for a roof deck of lightweight, insulating, *fire*-proof concrete using Permalite perlite aggregate. The school board, properly cost-conscious, could not see this extra expenditure—until they discovered that the added fire protection of the Permalite concrete roof deck would reduce their insurance premiums by $1,500 a year...$30,000 during the 20-year bond on the roof! This added *fire*-safety, so vital a factor in school construction, is provided by Permalite plaster aggregate and Permalite concrete aggregate in notable public buildings all across the country. Permalite plaster, used to fireproof structural steel members, has proved the simplest, most inexpensive, method of gaining 4-hour fire ratings. Permalite concrete in roof decks not only adds fire protection, but provides high insulation values as well. As witness, two new schools in Monroeville, Pennsylvania. Both have Permalite lightweight insulating fireproof concrete roof decks because calculation showed the architect that Permalite would provide a better "U" factor than other applicable insulating materials. Roof deck construction such as used in these schools is covered in complete detail in the authoritative 218-page Permalite Concrete Roof Deck Specification Manual—construction details, specifications, everything you need to save hours of work on a single job. If you don't have a copy, send in the coupon, today.







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QUIET Plus Beauty for Modern Hospitals

Foyer of Indianapolis Community Hospital, Indianapolis, Ind., showing ceiling installation of Striatone* Striated Mineral Fiber Tile. **Architect:** Daggett, Naegele & Daggett. **Acousti-Celotex Contractor:** Hugh J. Baker & Company.

This foyer of the Indianapolis Community Hospital is an attractive example of the highly compatible combination of quiet *and* beauty made possible when Acousti-Celotex Sound Conditioning is specified. Incombustible Acousti-Celotex Mineral Fiber Tile was installed throughout corridors, semi-private rooms, laboratories, wards, surgery rooms, nurseries, labor rooms, diet kitchens, other service areas, cafeteria, offices, lobbies, and lounges. Your Acousti-Celotex Distributor will be glad to discuss the use of Acousti-Celotex Sound Conditioning materials in all your projects. Write for information today!

*TRADE MARK

FOR FULL DETAILS on the complete line of Acousti-Celotex products, please write to The Celotex Corporation, 120 S. LaSalle Street, Dept C-27, Chicago 3, Illinois.

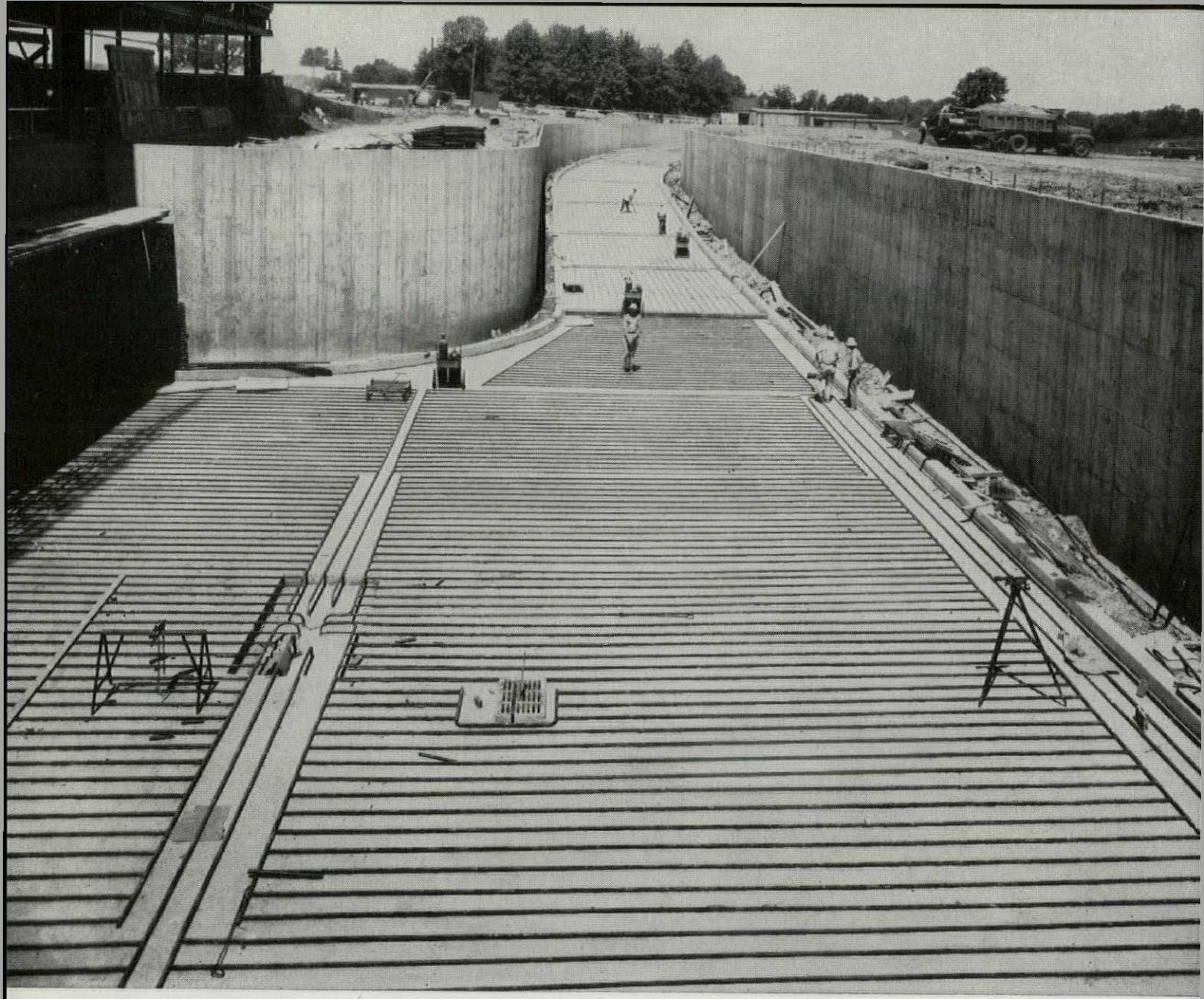
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Sound Conditioning

Products to Meet Every Sound Conditioning Problem . . . Every Building Code—



Built-in snow removal called for piping dependability —they used Wrought Iron

Not just snow melting—but *dependable* snow melting—was the leading design objective for this access ramp.

That's why designers of the new Connecticut General Life Insurance Company office building gave such careful consideration to material selection for this access ramp. Four major factors supported the use of wrought iron for this job: its corrosion-resistance—rugged strength—low coefficient of expansion with concrete—ease of fabrication.

In addition to snow melting service, wrought iron pipe was also installed for well water and cold water lines, chilled water mains, and well water piping in the heating and cooling system. Our booklet, "Byers Wrought Iron for Snow Melting Systems," offers case-history support for wrought iron's reliability in this service. Write for a copy.

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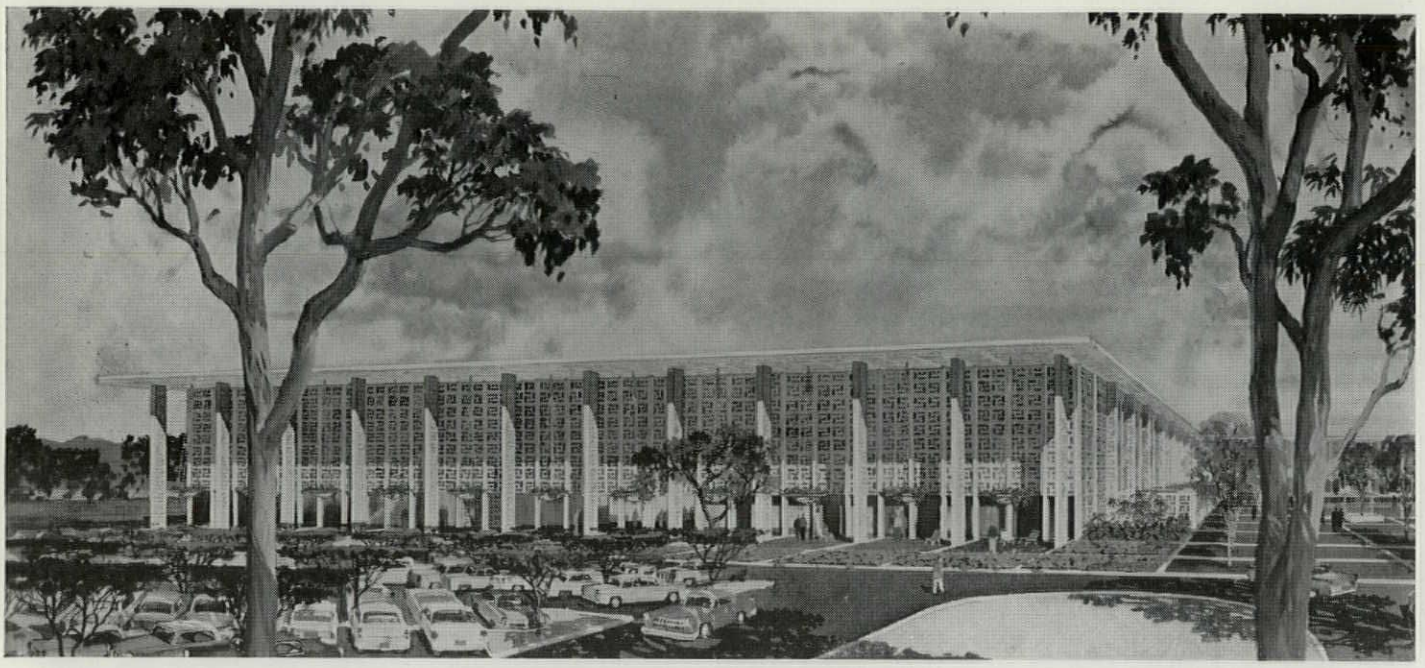


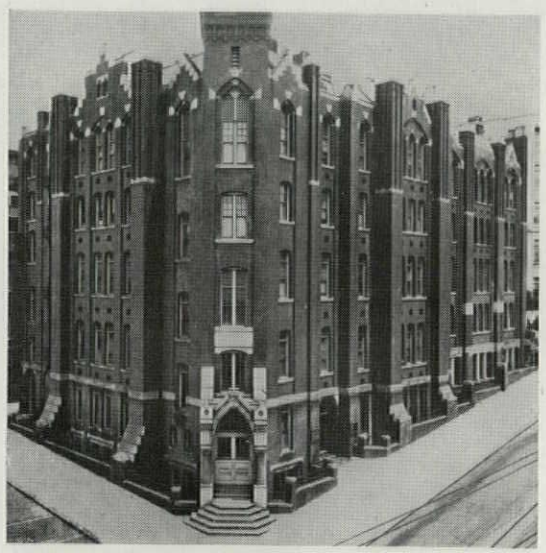
Lawrence S. Williams

NEW HOSPITAL SURFACED WITH PORCELAIN ENAMEL

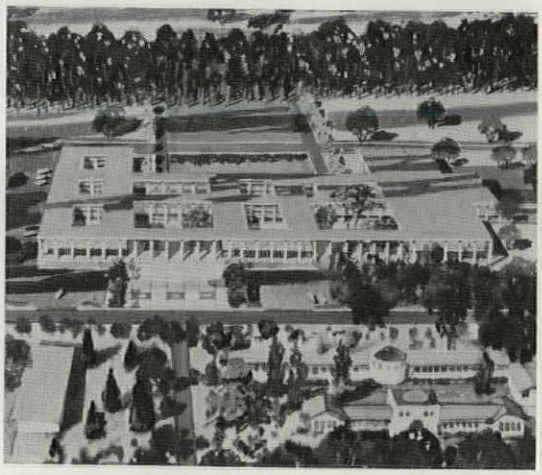
POTTSTOWN, PA., Jan. 15—Recently completed and scheduled for full publication in March 1957 P/A is this hospital notable for its unique system of erection and its use of porcelain-enamel panels. The panels, of brilliant salmon color, serve as exterior surfacing material as well as sun baffles. Construction extended over a two-year period, during which the new 5-story structure was built through the center of the old plant. Hospital functions in the old section were kept in operation during the entire building period, then transferred to the new wing, and the greater part of the old plant demolished. Building methods were consciously chosen for their cleanliness and minimum-noise ratings. Vincent G. Kling was Architect for this complex which, in addition to the new hospital wing (*above*), also incorporates a new school of nursing, a remodeled nurses' residence, a new maintenance and paint shop, boiler and laundry plant, and the remaining portion of the old hospital. Frederick G. Roth, Associate-in-Charge.

STANFORD STUDIES INTEGRATED MEDICAL CENTER





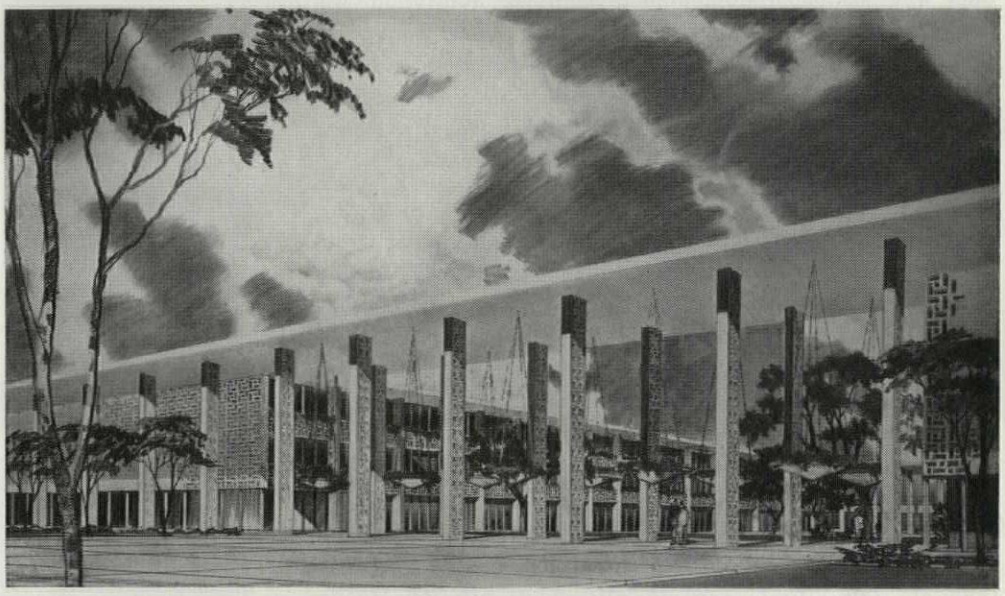
Old medical school, San Francisco

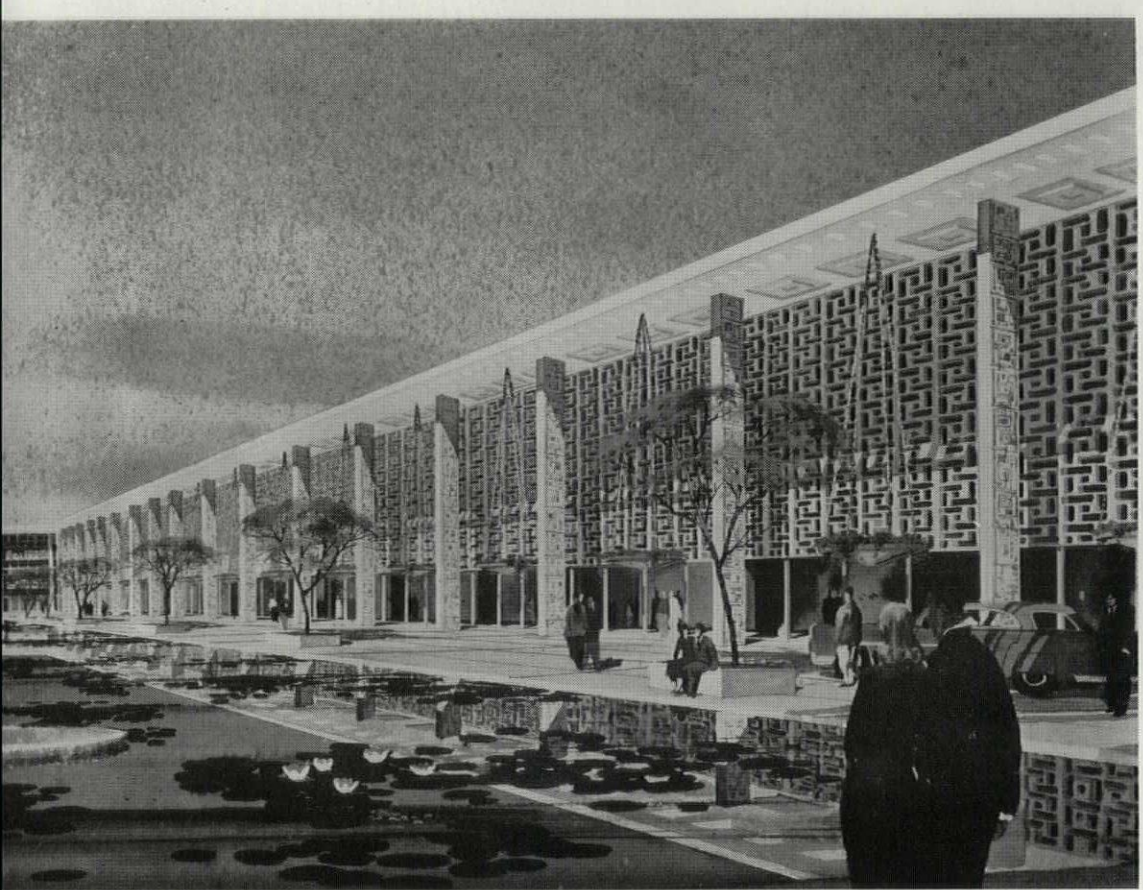




PALO ALTO, CALIF., Jan. 12 — Architect Edward D. Stone is currently developing design details of a remarkable medical facility to be built here on the campus of Stanford University. To be known as the Stanford Medical Center, it is a project by the University and the City of Palo Alto and will include a 226-bed Palo Alto Hospital pavilion; a 215-bed Stanford Pavilion (to be used as a teaching hospital); jointly shared core services; and the Stanford Medical School, presently located in old buildings in San Francisco (*photo acrosspage*). In addition to the teaching hospital, school facilities will include a rehabilitation center, clinics, teaching and research departments, and a library. Estimated total cost of the Center is $22,000,000.

While design elements are undergoing restudy, renderings of an advanced development stage (*shown here*) indicate organization around a series of landscaped courtyards and a rich design expression that minimizes institutional appearance. A bond issue of $4 millions, approved last fall by the citizens of Palo Alto, will finance construction of the Palo Alto Pavilion; plus the City's share of ancillary services. Stanford has appropriated $2 millions toward construction of the core and plans to spend $4.4 millions to complete its hospital pavilion. The $800,000 cost of the Rehabilitation Center is to be shared equally by federal and state funds and Stanford University.





News Bulletins

• Cornerstone for New York School of Printing (to open next January) was laid last month. New school will provide facilities for training 2727 students in three shifts from 9 a.m. to 10 p.m. to meet shortage of skilled workers in city's printing and publishing industry. Steel-framed structure designed by Kelly & Gruzen will consist of seven-story shop and academic wing with adjacent wing for gymnasium and auditorium. Entire façade of shop portion (first five floors) except for clear glass strip at eye level, will be sheathed in glass block with metal-louver inserts for ventilation. Two academic floors above will be articulated by set-back and aluminum double-hung windows; auditorium will be faced with brick. Unusual feature of building will be use of escalators to handle student traffic. Auditorium and gym will have separate entrances and lobbies off main plaza to facilitate community use. Area adjacent to main entrance and 10 ft below sidewalk will be used for recreation.

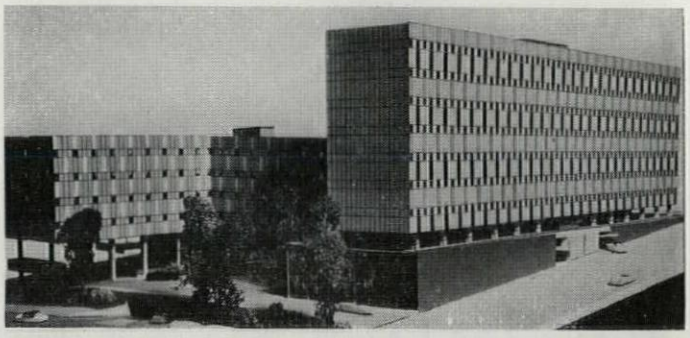
• When completed in 1959, steel-framed rectangular structure for National Bank of Detroit main offices will occupy full block in heart of financial district with east façade overlooking landscaped boulevard (right). Façades will be composed of alternating marble slabs and anodized-aluminum window panels. Vaults will be three floors below main banking floor at street level; with mezzanine and 12 business floors above, building will provide 580,000 sq ft of floor area. Mechanical equipment will be housed in set-back story at top. Access to escalator and 14 elevators will be possible from all four sides; trucks are to enter through ramp off one street. Feature attraction: exterior arcade paralleling two thoroughfares. Building designed by Albert Kahn Associated Architects & Engineers, Inc.

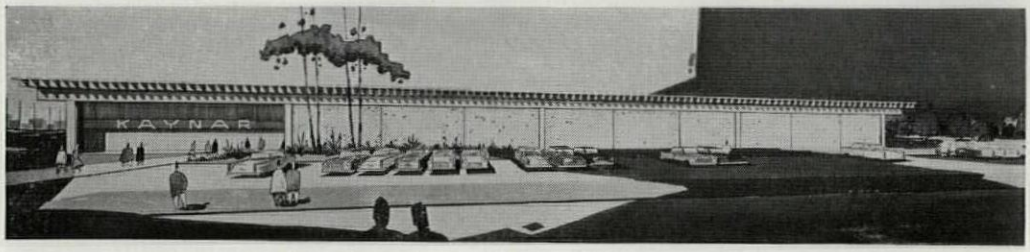
• Designed to combine atmosphere of resort with advantages of urban environment, new hotel/office building development in San Francisco, Calif., will be completed in early 1959. Nine-story office building with 600-car garage and six-story, 400-room hotel (right) will be situated about garden court and swimming pool. Hotel will have large banquet room seating 700 to 950 persons as well as small conference rooms, shops, bank, and bars. Registration desk and elevators in garage will permit guests to take baggage from car to room without traipsing through main lobby. Rooms, many of lanai type, face patio, garden, or view. Office building providing 15,000 sq ft area per floor will have both direct access to hotel and separate entrance. Architects for $10-millions job are Thomas Me. Price and Hertzka & Knowles.

• Unusual structural and mechanical innovations characterize 8000 sq ft plant for Kaynar Mfg. Co., Inc., now under construction in Riviera, Calif. Flat-roofed structure (right) utilizes prestressed-concrete roof slab, girders, and purlins. Uncommonly long spans create generous bays (67' x 60') for flexibility in factory and office arrangement. Novel "lightports" containing 8" diameter prismatic glass lenses are spaced regularly throughout entire roof area to provide uniform natural daylighting with minimum glare. Air-conditioning system with individually controlled temperature zones will supply refrigerated and heated water from central plant; to supplement air conditioning, roof will have permanent 2" layer of water that is heated, filtered, and recirculated in conjunction with 1000 roof sprays. Spaces between joists serve as pressure plenums for air circulation. Structure was jointly designed by Kaymar Mfg. Co., Inc., and T. Y. Lin & Associates, consulting civil-structural engineers, with John Lautner as architectural consultant.

• Fate of two much-publicized N.Y.C. projects still hangs in balance. Progress on Lincoln Square Redevelopment plan was hindered two months ago when residents and businessmen deemed relocation provisions inadequate. Robert Moses, chairman of Mayor's Committee on Slum Clearance, has since submitted three-year relocation plan for 6000 families and expects demolition to begin by midsummer. Meanwhile alternate plans are being studied. . . . Construction of Sports Center to house Brooklyn Dodgers will de-







pend on ability of Center to pay its own way via bond issue. Originally, center was part of broad redevelopment scheme proposed by city. Advance of $25,000 to Center Authority will finance survey to determine marketability of bonds. Rehabilitation of area will proceed in any event.

• AIA will present four Medal Awards for 1957 as follows: Centennial Gold Medal (special award for this occasion only) to Ralph Walker, New York; Gold Medal to Louis Skidmore, New York; Fine Arts Medal to Mark Tobey, painter, Seattle, Wash.; Craftsmanship Medal to Charles Eames, furniture designer, Venice, Calif. Other AIA honors, fellowships, citations to be announced.

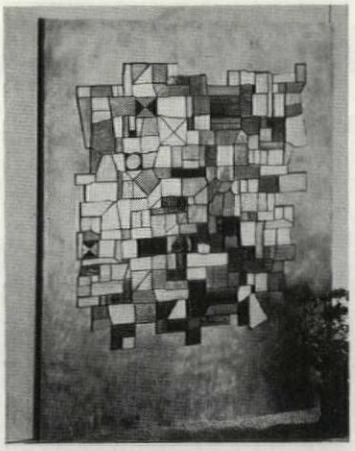
• Pratt Institute will award two graduate assistantships providing tuition plus $1500 to qualified architectural students. Write: Dean, School of Architecture, Pratt Institute, Brooklyn 5, N.Y. . . . University of Pennsylvania is offering several graduate fellowships in architecture and related fields. For data write: Dean, School of Fine Arts, University of Pennsylvania, Philadelphia 4, Pa.

• Pipsan Saarinen Swanson received Louise Bolendar Award for "most distinguished contribution by a woman to home furnishings field in 1956," given by Home Fashions League of Illinois. . . . President's Medal of Architectural League of New York has been awarded to John Davidson Rockefeller, Jr., in recognition of his "signal generosity and discriminating encouragement to architecture and the arts." . . . Seymour Lipton, New York sculptor, won $2000 top prize in 62nd American exhibition of painting and sculpture held at Art Institute of Chicago.

• Builders now have official sanction to use term "lift-slab" —in designating slab-lifting method of construction—without fear of reprisals by firms using term as trademark or tradename. Virtual monopoly on term was ended recently when Judge Wm. J. Palmer awarded court costs to Western Concrete Structures Co., Inc., Los Angeles, defendants in suit by Vagtborg Lift Slab Corp., Los Angeles and U. S. Lift Slab Corp., Austin, Tex., for Violation of Confidential Disclosure, Trade Mark Infringement and Conspiracy in Unfair Competition.

• 1957 Nuclear Congress to be held Mar. 11-15, at Philadelphia Convention Hall, will cover peacetime applications of atomic energy for commerce and industry in conjunction with International Atomic Exhibition. For copies of program write: Engineers Joint Council, 29 W. 39 St., New York 18, N. Y. . . . Building Research Institute will hold 6th Annual Meeting in Chicago, Apr. 15-17.

• 2nd Exhibition of Architectural Photography intended to stimulate interest in specialized field and demonstrate its value to architects, will be on view at AIA gallery, 1741 New York Ave., N.W., Washington, D.C., until February 27. Among prizewinning submissions is dramatic photo of MRA Racetrack, Livonia, Mich. (right) designed by Giffels & Vallet, Inc., & L. Rosetti, and photographed by Mason Pawlak. Other winners were Gabriel Benzur, Joseph W. Molitor, and S. C. Valastro.



• To exploit the decorative possibilities of aluminum products, Aluminum Company of America has inaugurated FORECAST, three-year program which commissions noted designers "to create in aluminum their impressions of the comforts and luxuries in tomorrow's homes." Among initial projects, mosaic of multicolored pieces of foil against heavy-gage aluminum-foil wall covering (left) was created by Ilonka Karasz, wallpaper and fabric designer. Other projects are: tri-color aluminum stack table composed of three aluminum units bent to form triangular legs and hexagonal table top, by Isamu Noguchi, sculptor and designer; peach-and-gold aluminum-lamé gown by Jean Desses, fashion designer. Projects will be exhibited in principal cities. . . . Addenda: Alcoa is planning campaign to stimulate use of aluminum in homebuilding. Plan includes: formation of Residential Building Products Advisory Committee of architects to solve specific design problems and develop new building methods; creation of Home Design Conference to meet in April with Pietro Belluschi of MIT presiding; promotion of "Care-Free House" —model home project designed by Washington Architect Charles M. Goodman—will be reproduced in 50 locations throughout nation to demonstrate aluminum applications.

• Winners of 1957 "Design in Hardwoods" competition were recently announced in Chicago. In architectural design classification, top awards went to Marshall W. Perrow, Tacoma, Wash., for restaurant interior featuring decorative free-form wall of concave birch boards mounted on curved hardwood plywood (below right); Bertrand Goldberg, Chicago, for home constructed with hollow-core plywood exterior walls and plywood interior paneling. Other top winners were Edward Wormley, Isamu Noguchi, and Lewis Butler, New York City, for production furniture; Samson Berman Associates, Flushing, Long Island, N.Y., for custom furniture; B. W. Hendrickson and A. C. Hoven, Grand Rapids, Mich., for molded plywood church pews in general products category. Designs will be displayed through 1957 at permanent Hardwoods Exhibit in Chicago's Museum of Science & Industry.





Washington Report

by Frederick Gutheim



Most recent addition to Washington's shopping list, which the city takes to Congress annually, is an auditorium. If the legislative body sees fit to take action on a bill introduced by Rep. Oren Harris, Arkansas Democrat and member of the House District Committee, the National Guard Armory Board will be authorized to issue revenue bonds for the project. The much worked-over bill, now approved by all major local interests, specifies a 200-acre site in the valley of the Anacostia River, endorsed by the National Capital Planning Commission for the medium-sized facility. This action is the result of various compromises among business and governmental interests, and is designed to replace the obsolescent commercial stadium that has long served professional baseball and football teams. Located in a built-up area, and without parking facilities or room for expansion, the old stadium's inadequacies have threatened the survival of professional baseball here. While a better solution could be found by using the pending Northwest Redevelopment Area program, there seems no disposition to take the time necessary to plan a better answer. The result is another of those hashed-over political compromises that meet the need but do nothing more. Indeed, a closer look at the revenue potential of the new facility, or its rejection by the Washington baseball club (which does not seem firmly hooked by the plan), may still invalidate it.

• While progress continues on such dispersed Government buildings as the Atomic Energy Commission, Bureau of Standards, and Central Intelligence Agency, and more of this sort of construction is still to come, a substantial amount of Government office building is also taking place in the center of Washington. President Eisenhower and Secretary of State Dulles have laid the cornerstone of the new State Department building. Four additional buildings have been initiated in the Southwest Washington Redevelopment Area. The Food and Drug Administration and a number of undesignated agencies are to occupy the new buildings, which have a total cost of nearly $70 millions. These are in addition to three other buildings to front on the proposed Tenth Street Mall in the same general area.

• As in many other parts of the country, Washington's building slumped in 1956. The year-end figures showed a total of $180 millions, about $20 millions under the previous year, to make it one of the least active years since the war. Housing construction sagged badly to a total of 5000 units less than 1955, but other types of building held reasonably steady. Raising FHA interest rates to 5 percent does not yet seem to have helped homebuilding activity here or anywhere else, and a smart legislative row is in prospect. On one side are mortgage bankers, the HHFA and FHA, who propose beefing up mortgage credit by expanding the Federal National Mortgage Association (Fanny May, as it is called by the breath-savers). On the other side are proponents of direct Government lending to veterans, headed by Rep. Olin Teague, Veterans Affairs Committee Chairman. The line-up is familiar—and both remedies are old ones. The political line-up in today's Congress, the most predictable I can remember, favors the Administration. Those concerned only with the decline in housebuilding have difficulty in comprehending that this objective is secondary to over-all economic management goals in the minds of nearly everyone else. Who is to manage the economy, and for what purposes, is probably this year's most important political question. The form in which it is being posed is whether to continue the Federal Reserve System as an independent entity, or to co-ordinate its policies with those of the Treasury and Government lending agencies through some new Governmental machinery. The current row over housing-credit policies offers a concrete illustration that fiscal co-ordination in the Executive branch, at least, is today a fact. But what Congress faces is shouldering the responsibility for our national economic well being, if it tinkers too much with credit to attain specific objectives, e.g., veterans housing. It is hard to see that Congress has been goaded that far—yet.

• Allocation of $24 millions in grants and $79 millions in loans for Washington's Southwest Redevelopment Area by the Housing and Home Finance Agency assured an early start on land acquisition and the financing necessary to carry through this 446-acre project. "A dramatic demonstration of urban renewal" and "a signpost and symbol for the rest of the country," were expressions applied by HHFA administrator Albert M. Cole to the big Webb & Knapp project. The grant covers two-thirds of the project's net cost.

Louis Checkman



Design of U. S. Pavilion for Brussels World's Fair, 1958, by Architect Edward D. Stone, was revealed January 25 by Howard S. Cullman, U. S. Commissioner-General to the Fair. Organized on a sloping site, scheme includes 200-ft-long elliptical lagoon in a landscaped entrance place; 381-ft-diameter pavilion; and an auditorium beyond. Roof structure of the steel-columned pavilion somewhat resembles a huge bicycle wheel, with outer compressive "rim" of reinforced concrete connected to an inner metal "hub" by high tension, steel-cable "spokes." Roof surface is translucent plastic. Exterior hung walls are a plastic honeycomb. At center of main level is a great, round, water garden.



Molded modules are cantilevered in pairs from a 16-ft square central utility core to form four 16-ft square rooms. Completion of the full-scale house is scheduled for June in the Tomorrowland area of Disneyland at Anaheim, Calif.

Monsanto Tests Bents for "House of the Future"

SPRINGFIELD, MASS., Jan. 16—Since the announcement of plans for Monsanto's "House of the Future" *(December 1955 P/A)*, full-scale reinforced polyester plastic bents have undergone extensive tests here, and currently at Trenton, New Jersey, the laminated modules for the completed house are being produced by Winner Manufacturing Co.

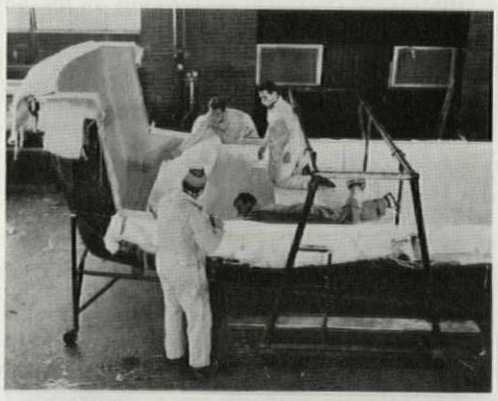
First fabrication step was to form a matrix of an epoxy resin - glass - fiber laminate with an impregnated honeycomb core. Next a protective polyvinyl alcohol film was placed in the mold and in turn was surfaced with 10 glass-fiber layers comprising a total thickness of 0.3" **(1)**. This built-up mat was then sprayed with a polyester resin (which penetrated the glass-fiber layers) to a thickness of 3.6" **(2)**. Another plastic film separated the "raw" shell from a rubber pad—blanketing the entire assembly — required for a vacuum process that maintained 12 psi pressure over the entire surface. The mold was placed in an oven, heated to approximately 225 F, and after four to six hours removed and the shell released **(3)**. For mass production, giant molds and assembly line techniques would undoubtedly replace this fabrication method.

After the bents were anchored to a simulated core, testing began. Under thermal-shock load, hot water and steam sprayed from sprinklers developed a surface temperature of 114 F on the roof while the ceiling remained at 34 F **(4)**. The U-factor of each bent is 0.15. When the combined upper and lower bents were loaded to 13 tons (twice design load), a maximum deflection of 1¼" and a maximum stress of 1650 psi were recorded **(5, 6)**.

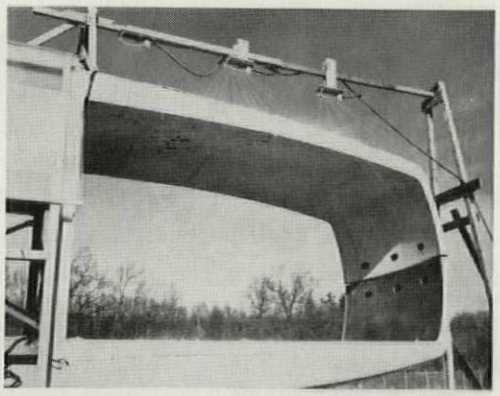
Owens - Corning Fiberglas Corp. helped develop the reinforced plastic material and Lunn Laminates made the test bents.

BURTON H. HOLMES

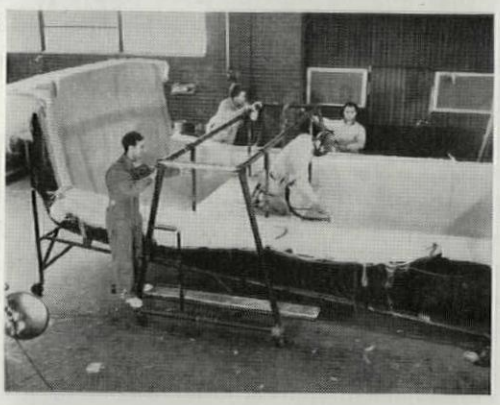
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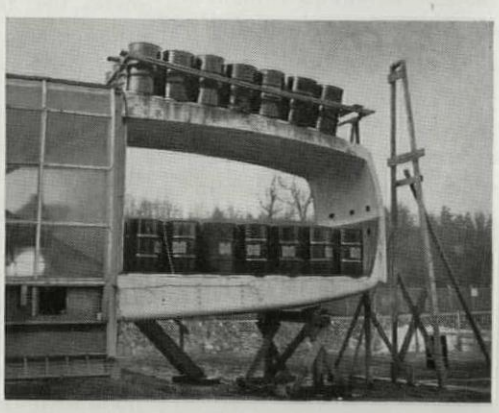
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2



5



3



6



Financial News

by William Hurd Hillyer



Those who have seen plans for some of the more recently designed bank domiciles are beginning to ask themselves: "Is a reaction setting in, after the extreme openness of recent examples, toward traditional architectural design?" If such a drift has begun (and after all, the banking realm, traditionally, is the most conservative of domains), the new home of the City National Bank of Fort Smith, Arkansas, might be cited as an all-inclusive example. The three-storied brick chateau follows French Provincial design yet incorporates such modern conveniences as below-the-street parking, drive-in banking windows, and an after-hours depository. Front doors are of Florentine inspiration; on the interior an open fireplace is flanked by native-stone finish of soft, non-marmoreal tint. Bassham & Wheeler, Fort Smith, are the architects.

• Creeping conservatism with its accompanying tight money is beginning to dominate this country's financial field, if not its architecture. Gathering strength as the New Year takes hold, the trend may catch up with creeping inflation before the twelvemonth is half spent. Meanwhile, the interplay of additional and contrary forces has brought about what the Guaranty Trust Company of New York calls "a clash of objectives." This, in turn, has engendered a difficult economic "trilemma." Rising wages (one objective) are causing upward price pressure. To maintain price stability (a second objective), Government is allowing the money market to remain tight. This policy is being criticized as interfering with full employment (a third objective). Such aims, apparently irreconcilable, may be resolved if intelligently pursued, but only if wage increases are limited to gains in productivity, the trust company concludes. A practical solution might be found in a quasi-political compromise (pleasing to nobody) involving partial achievement and partial sacrifice of the diverse aims.

• Consumer credit also presents anomalies, with auto instalment sales dropping $29 millions a month but other forms of individual debts continuing to rise. Total consumer instalment debt is up some $2.8 billions above the 1954-55 year-end to a $31-billions aggregate; charge accounts and other non-instalment credit rose $222 millions during November. Seasonal spending may have been responsible for much of the disparity. However, the figures indicate a slowdown in commitments on wheels—perhaps preparatory to a speed-up toward brick and mortar.

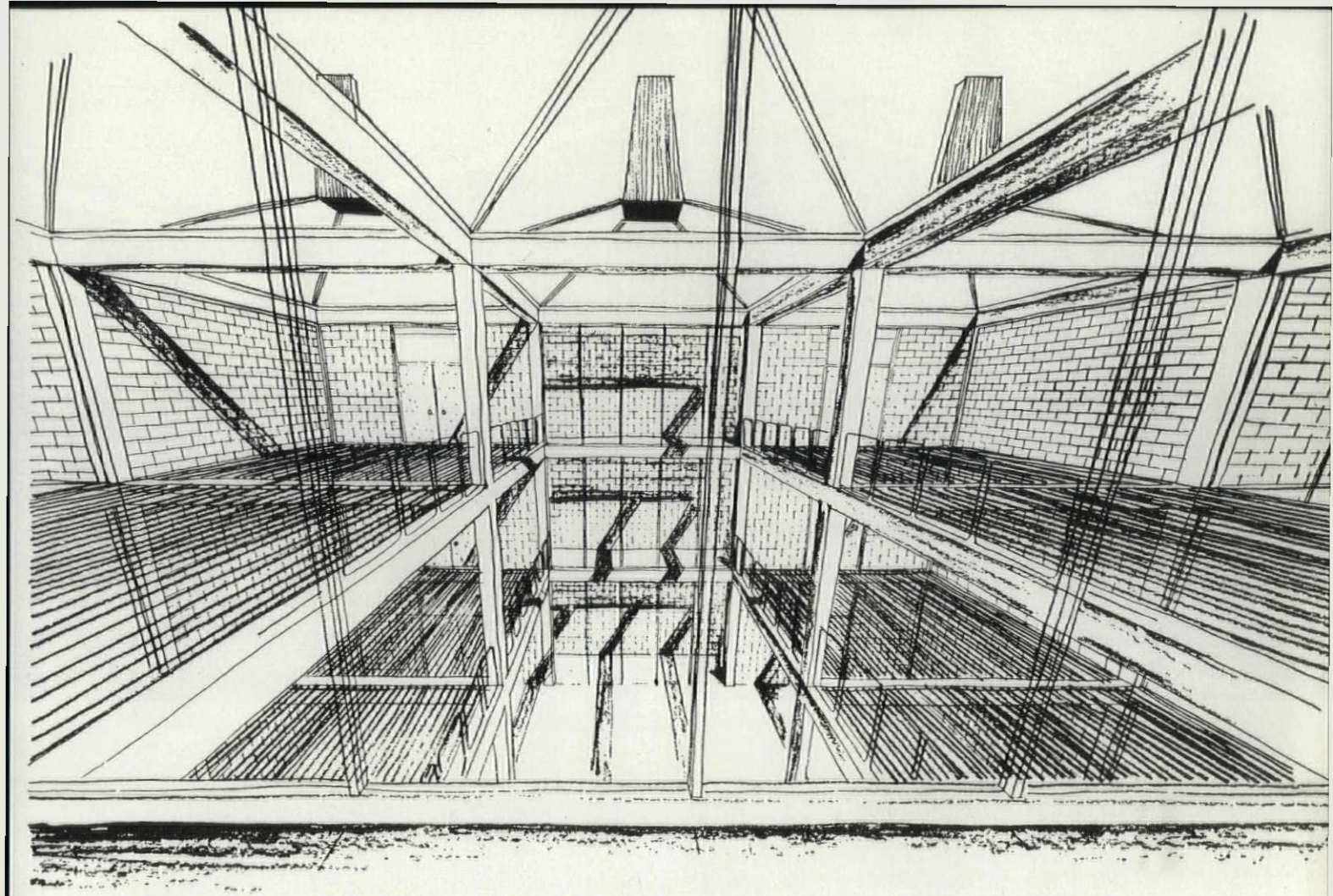
• Much has been said lately about increasing population as a guaranty of expanding prosperity. Fallacies inherent in this view are exposed by a two-part editorial in the American Banker, daily banking newspaper. The editorial questions whether we shall continue to possess those "economic additives" which will give our ascending population both prosperity and a higher living standard. A huge amount of capital will be necessary, it is pointed out, merely to provide the million or more new families each year with means of homemaking: $10,000 (at least) for a house; $10,000 for motor car, furniture, and appliances; similar sums, respectively, for the family share in schools and other community facilities, and for plant and tools where the breadwinner will toil. These figures add to $40,000 minimum investment per family, of which fully half comes under the architect's dominion. The editorial makes clear that the responsibility of finding this capital is largely a matter for bankers.

• More income may be directed into savings during '57 than last year, First National Bank of Chicago tells its stockholders. Although this reversal of tendency would stem from curtailment of expansion, the consequences would be "beneficial" through keeping inflationary pressures under control, the bank believes. Another Chicago institution, Harris Trust, goes further and reports that the savings movement has actually begun. "In the past year, the volume of savings has increased more than a third," the bank declares, and consumers are now laying aside more than their augmented income, percentagewise.

This encouraging symptom tends to offset the gloom engendered by the continued fall in Government bond prices, now nearing a record low. Long-term Treasurys are down to 91, Victory 2½'s to 87, and the 3¼ bonds have slipped to 96. These figures reflect the extreme money tightness that marks the new year with no sign of price recovery. The stringency is in turn aggravated by these declines, which load the banks with tremendous paper losses in their bond portfolios.

• An oft-repeated assurance is to the effect that the Federal Reserve System has so firm a hold on the banking fabric of the United States that it can and will put in motion the powerful machinery at its disposal to head off a drastic depression, as soon as one shows forelock. True enough, but how many realize that the Federal Reserve is a dwindling empire? Savings and loan associations, to say nothing of credit unions, are forging ahead at a prodigious rate; yet none of these are subject to Federal Reserve control. If the present relative pace continues, warns Chairman Newbury of the New York Bankers Association committee to study this situation nationally, the Federal's monetary controls will, before long, prove intellectual.

• Banks and realty investors are neglecting a huge market in residences for the aged, according to Treasurer Mitnick of the National Association of Home Builders, a specialist in such housing. "Lending institutions today should realize that home loans to older people are really safe investments," he is quoted as saying. The effective life of the average mortgage is eight years, Mitnick avers—much less than the life expectancy of the typical age-65 borrower.

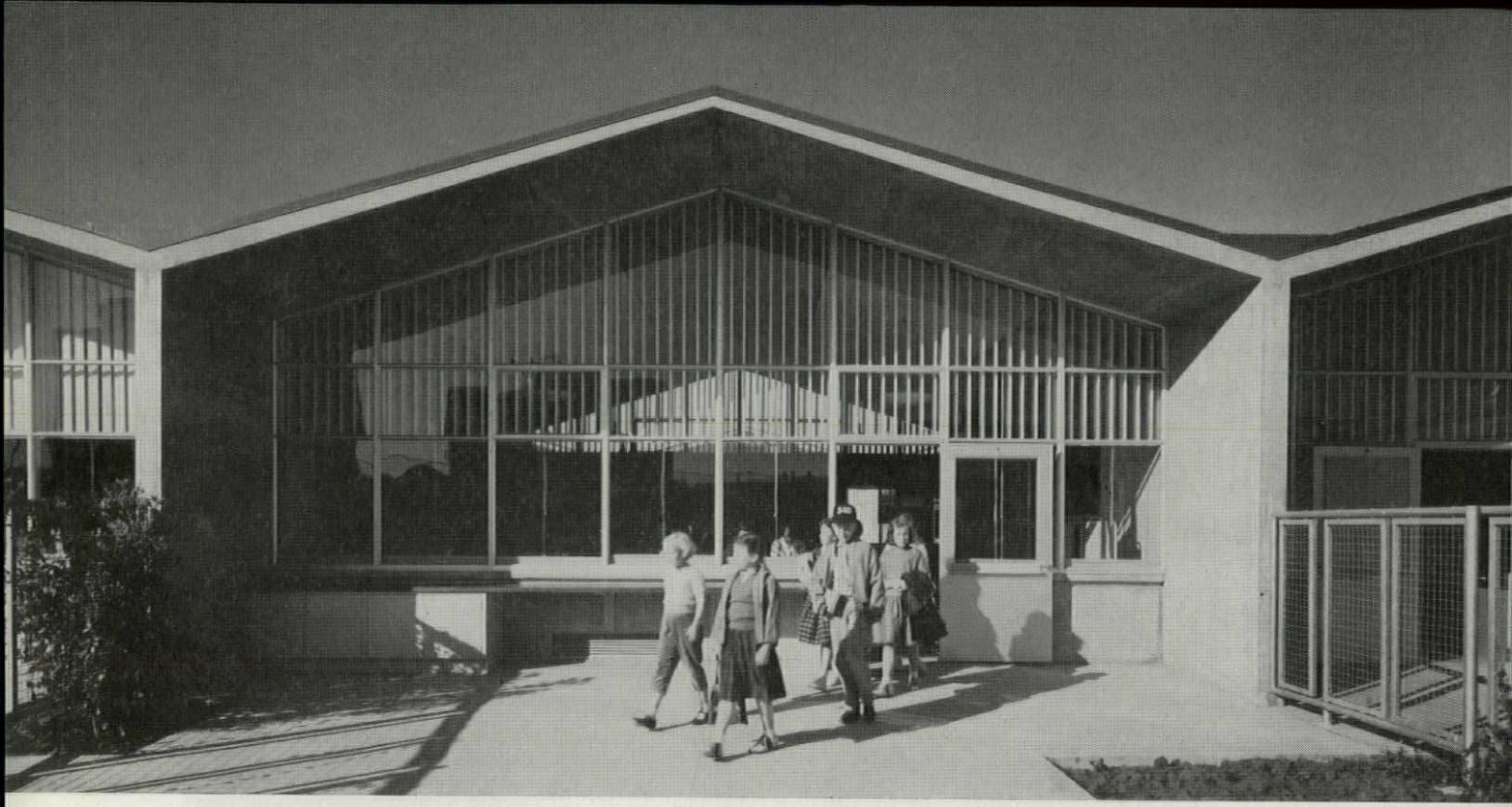


buildings for education

Few fields of professional practice today are more active than the design of buildings for education. A few years back, the demand was particularly insistent for elementary schools. While this need has by no means been filled, the pressure is now equally acute in the junior and senior high-school categories, and at the college or university level.

This issue of P/A was planned both to herald a record of progress and to present a current survey of the range of building types required for today's educational needs. One will find here thirty-two pages of public schools, both elementary and high schools; a unique "demonstration school" where students planning to become teachers observe the highest standard of teaching methods and procedures; a proposed school for the arts and crafts; and a theological school and chapel for a university.

In design, too, one will come across the broadest divergence—from the most basic, low-cost unit to structures worked out in the new and freer forms that currently intrigue many of our leading architects. And one will find throughout a design confidence and serenity that, we feel, bodes well for the future—for the student who attends these schools no less than for the architect commissioned to design them.

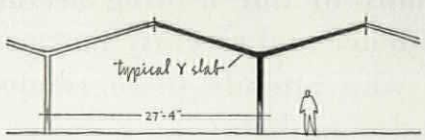


demonstration school

Occasionally a school appears that is so very special in its sponsorship and concept, while having much in common with the average school, that it must be regarded as a model of its kind. Such a one is the Frederic Burk School, in the burgeoning Lake Merced district of San Francisco. Basically, it is just a new elementary school serving this area of the city: but it is much more than that.

In the first place, it is a co-operative effort jointly shared by the San Francisco State College and the San Francisco Unified School District. The building and its site are the property of the School District, while the playground is the property of the College. The school, though built and equipped by the city, is administered by the State College. This exceptional joint enterprise, in addition to serving routine needs of an elementary school, also is a demonstration or laboratory school for students at the College who are training to become teachers. These students do not practice teaching here; but they attend classes to observe teaching procedures and methods—and, incidentally, because of the architects who were commissioned to design the school—enjoy a most expertly planned and handsome school plant. This remarkable program also means that the teachers at this school are specially selected for their teaching ability. Though the school functions in this unusual manner, every effort is made to keep classroom periods entirely normal; and about the only physical provision that reflects the dual nature of the school is a bench in each classroom, that students training for teaching careers may occupy. These are not at the school during every period, or even every day, but visit selected classes related to their own instruction courses. In addition, of course, the College students use the school auditorium frequently for seminars, lectures, and demonstrations.

Classroom groups are organized in east-west wings, with enclosed corridors along their north walls and roof projections and sun-control devices on their full-windowed south walls (*above*). Each room has its outdoor work area, and, for the youngest classes, individual toilet facilities, occupying a portion of the deep, south-facing reveals.



CLASSROOM SECTION

The "pitched roof" effect of the classroom elements—which, incidentally, results in a playful skyline and contributes an intimate sense of protection—grew out of the adopted structural scheme. Steel was uncertain when the design was going forward. To meet the need of a fireproof, as well as economical, structure, an ingenious concrete system was devised, consisting of a series of balanced Y-section slab frames, tapered from 7 in. at the haunch to 4 in. at the peak. The base of the Y forms a partition wall between adjoining rooms, while the arms form the roof pitch. This system not only eliminates columns, beams, or ribs, but also provides smooth wall surfaces. Twenty-seven of these Y slab frames define all of the classrooms, the administration unit, student-organization room, and school library.

The multi-use auditorium (*acrosspage*) is framed with concrete three-hinged arches, related in form and concept to the balanced Y's. As a foil for the sloping roofs of these structures, conventional, concrete, rigid frames were used for the flat-roofed cafeteria wing and

secondary areas such as corridors, toilets, utility wing, faculty room, etc. Walls between arches and frames are of reinforced, structural brick, left exposed both inside and out. To permit movement, all walls are kept free of the three-hinged arches and balanced Y's with a 3-in. separation, closure being effected where necessary by flexible copper joints.

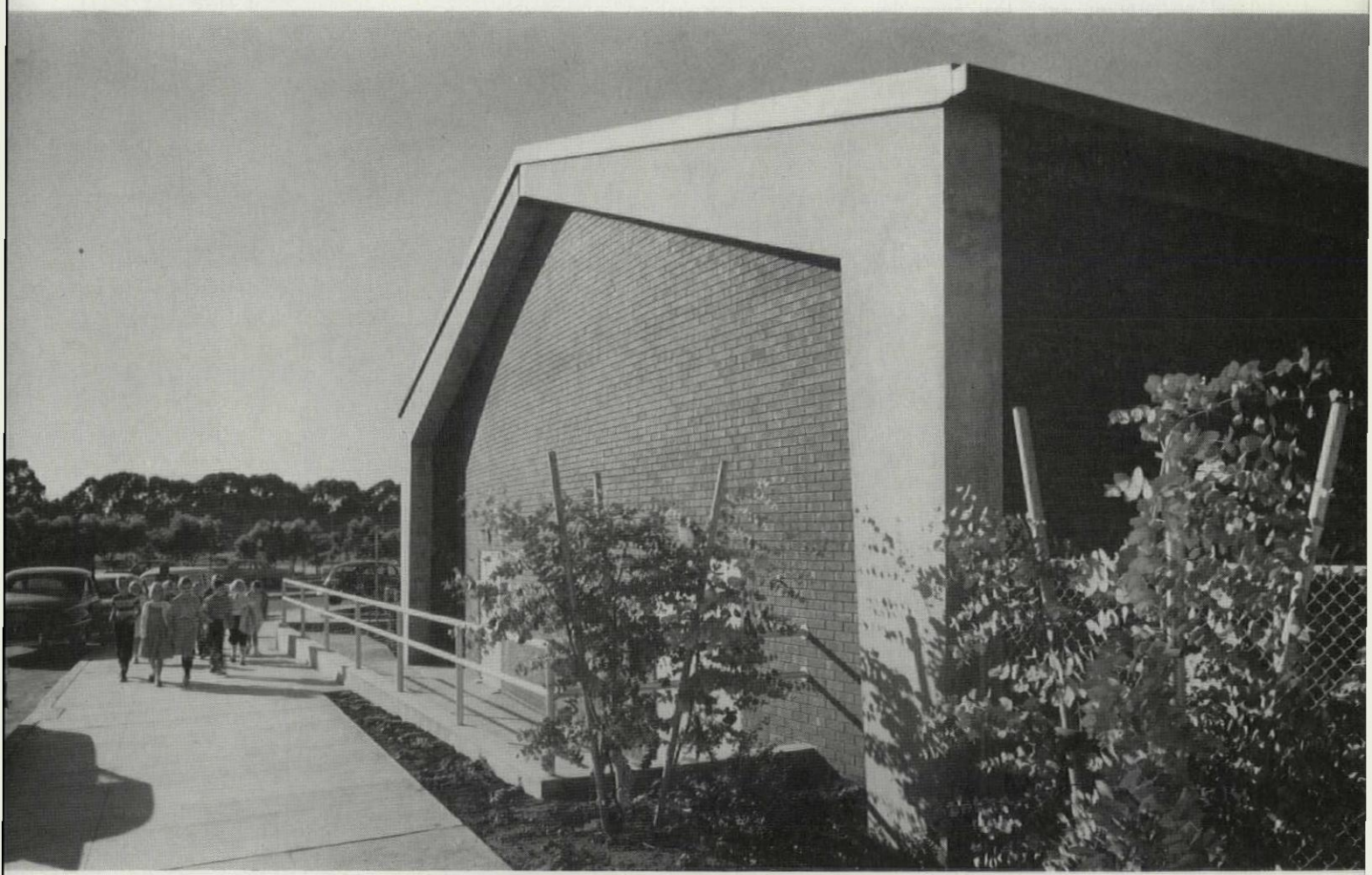
Most of the materials have integral finishes—the exterior with exposed concrete and brick, unpainted copper gutters, and anodized aluminum sash; the interior, with exposed concrete structure, prefinished acoustical tile, anodized-aluminum trim, baked-enameled steel sun louvers, quarry-tile and asphalt-tile floor surfaces, and cork-tile wall surface. Basic consideration here was, of course, minimum maintenance. At the request of the City Architect's office, however, doors, door trim, library shelving, and multi-use room wainscot are in wood, and paint is used on some of the exposed concrete within the classrooms only, and on downspouts, vent pipes, etc., for color accent.

All spaces within the school were engineered acoustically. Treatment for absorption includes slit resonators with glass-fiber backing (wood wainscots and wall surfaces in multi-use room, auditorium, and cafeteria), corkboard, and fiber tile. In addition, the architects report, "the characteristics of the brick surfaces are part of the scheme."

Client for the school was the San Francisco Unified School District; Superintendent of Schools, Harold Spears (Herbert C. Clish, prior to July, 1955); Assistant Superintendent for Buildings and Grounds, Robert J. Stoffer.

Educational Consultants were Nicholas N. Englehardt, Consultant to the San Francisco Unified School District; Irvin C. Futter (Maynard Lynn, prior to July, 1952), Principal of the San Francisco State College Laboratory School; and Fred T. Wilhelms, Chairman, San Francisco State College Division of Education and Psychology.

Richard S. Chew, Structural Engineer; Theodore M. Kuss, Preliminary Engineering; G. M. Richards, Mechanical Engineer; Charles Von Bergen and William Laib, Electrical Engineers; Dariel Fitzroy, Acoustical Engineer. General Contractor was S. J. Amorosa Construction Co.



location	San Francisco, California
architects	John Lyon Reid & Partners
partner-in-charge	Burton L. Rockwell
San Francisco city architect	Charles W. Griffith
job captain	Dale Stancliff
landscape architects	Eckbo, Royston & Williams

demonstration school



Special plan features include installation of circular wash fountains in the main lobby of the school, where they encourage pupils to wash on the way to the cafeteria, as well as supplement the toilet rooms; arrangement of auditorium, multi-use room, and cafeteria so that they may be used independently from remainder of the school; and planning of the administration unit as an integral part of the classroom area.

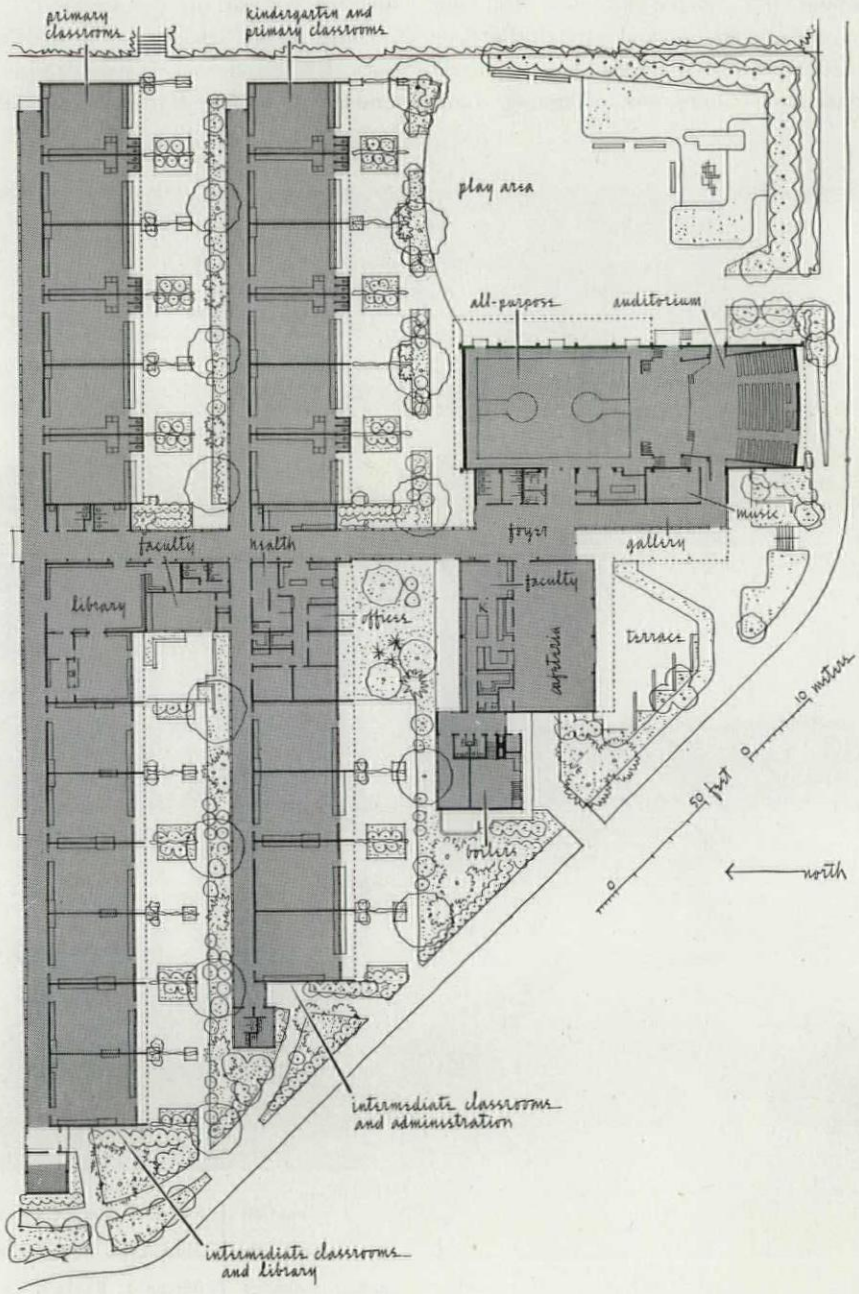
An economical plan feature is the enclosed platform or stage that opens in two directions—through a curved proscenium to the auditorium or, by means of a sound-intercepting, folding partition, to the multi-use room. Use of the dual-purpose platform made resourceful use of the limited site as well as saved money.

Primary and kindergarten rooms have individual toilets and two sinks. Note in plan the seating provision (bench) in each room that will accommodate ten of the trainee-observers. To compensate for space relinquished for this purpose, much wall space is of corkboard, and much equipment consists of movable carts—for music storage, block storage, carpentry tools, clay bins, etc. This system also facilitates observation of teaching methods.

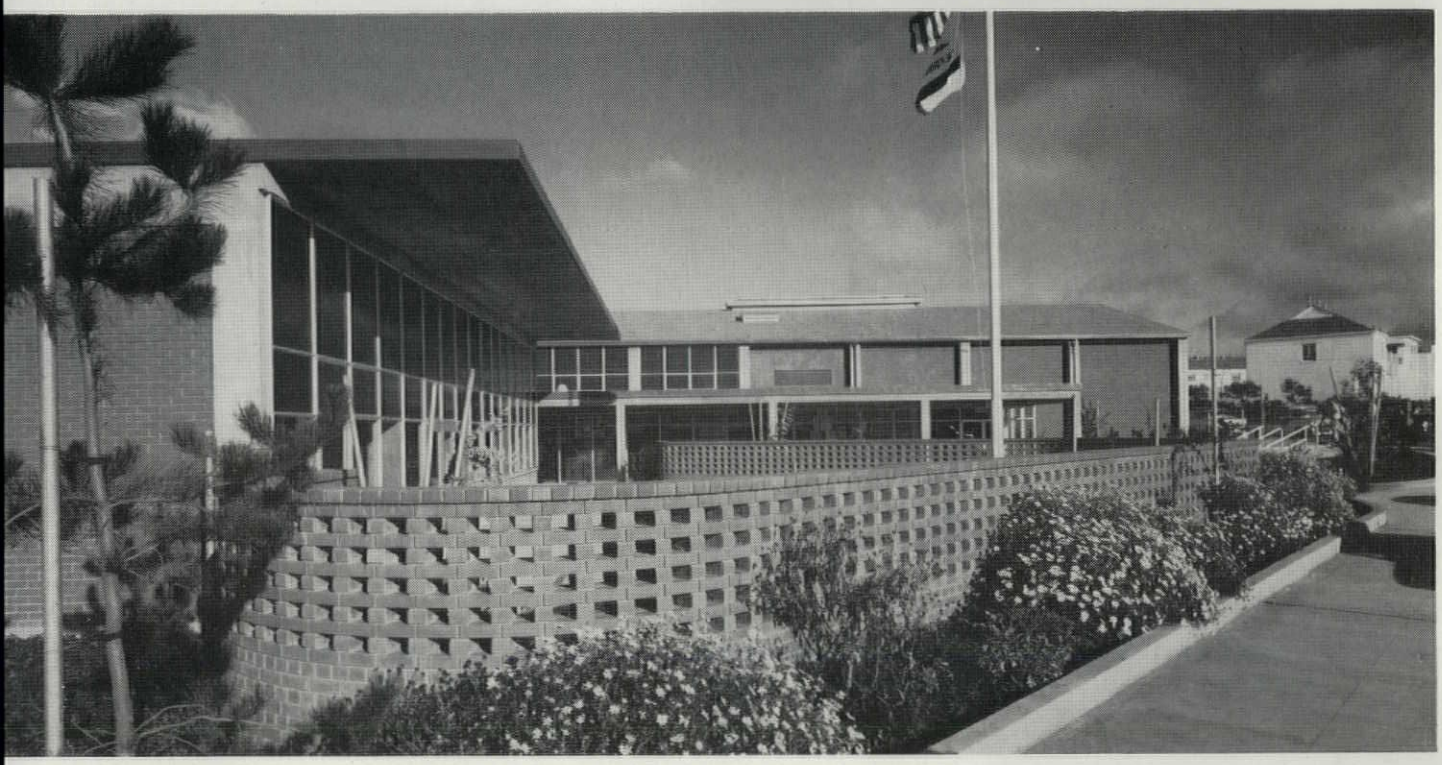
Tempered fresh air is supplied throughout—by central units in public spaces; unit ventilators in the classrooms. In addition, kindergarten and primary rooms have floors heated by hot-water coils.

With the exception of the auditorium, all areas have abundant natural lighting. Vertical louvers adjustable for sun control and for room-darkening are provided at all classroom windows, except for view strips into the outdoor classroom areas, where roller shades are provided for darkening. Artificial lighting is incandescent, with concentric-ring fixtures used in the classrooms.

Construction cost, including all contracts and site work, came to $867,120—or $18.92 per sq ft.







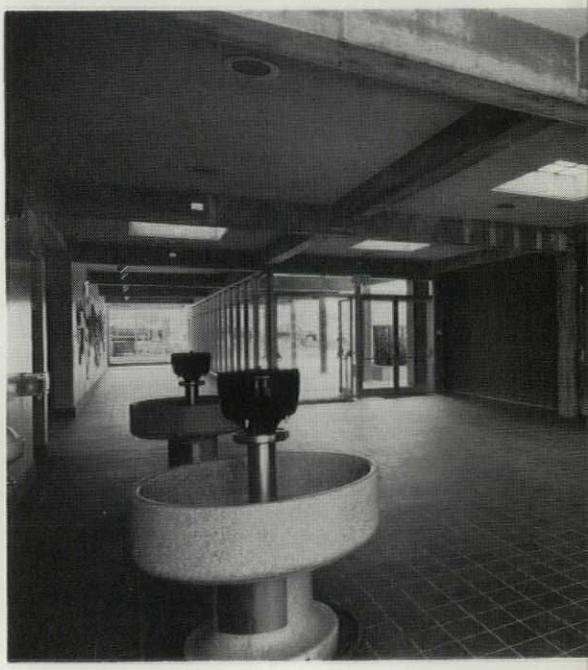
Main entrance (acrosspage) *occurs between the multi-use-auditorium wing* (*right*) *and cafeteria* (*left*).

Along north sides of classroom blocks are enclosed access corridors (top).

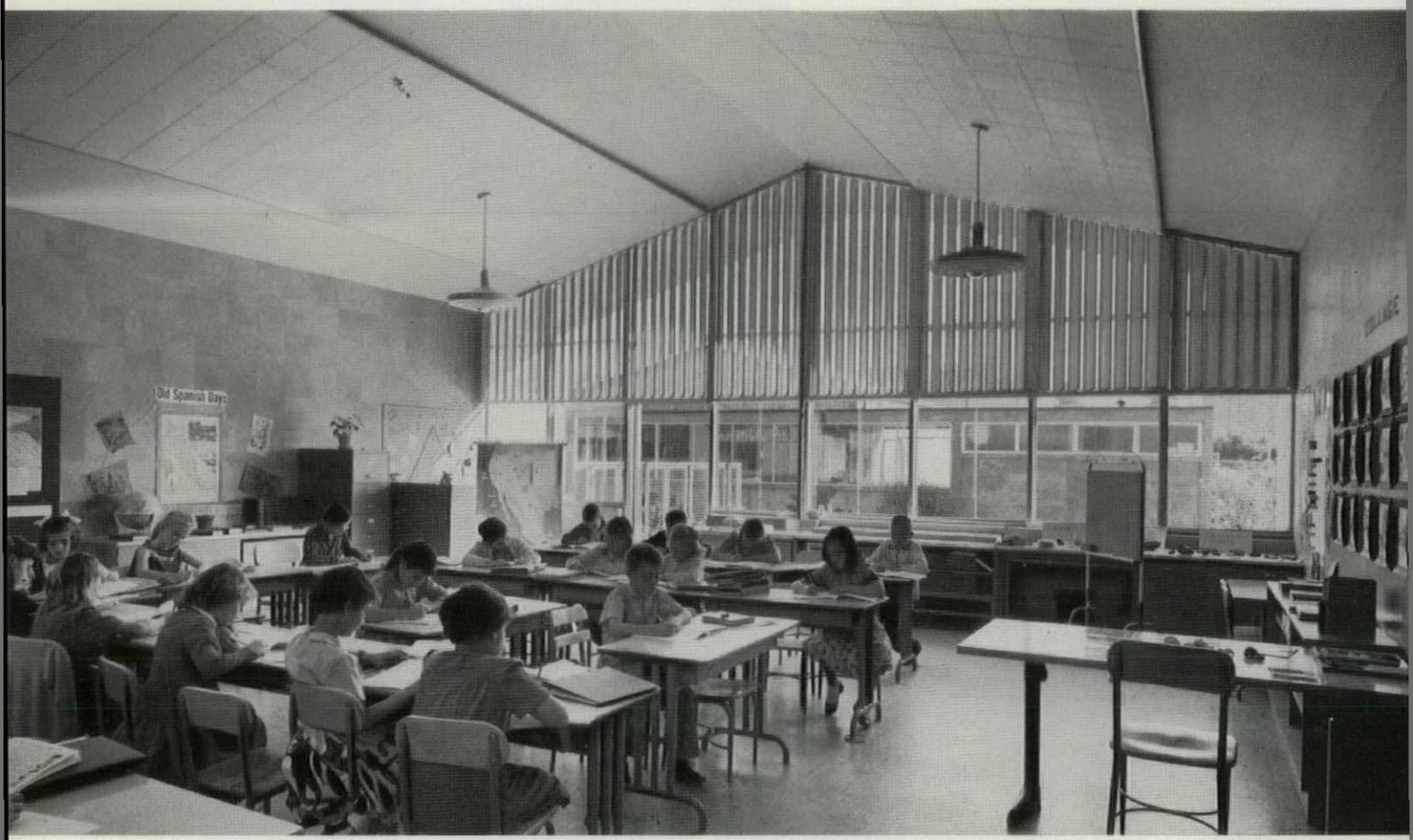
For a new school, the landscaping here is exceptionally rich and complete (above).

The entrance lobby (right *and* below) *has free-standing wash fountains and a well lighted gallery for display of student work; quarry-tile flooring.*

Photos: Roger Sturtevant







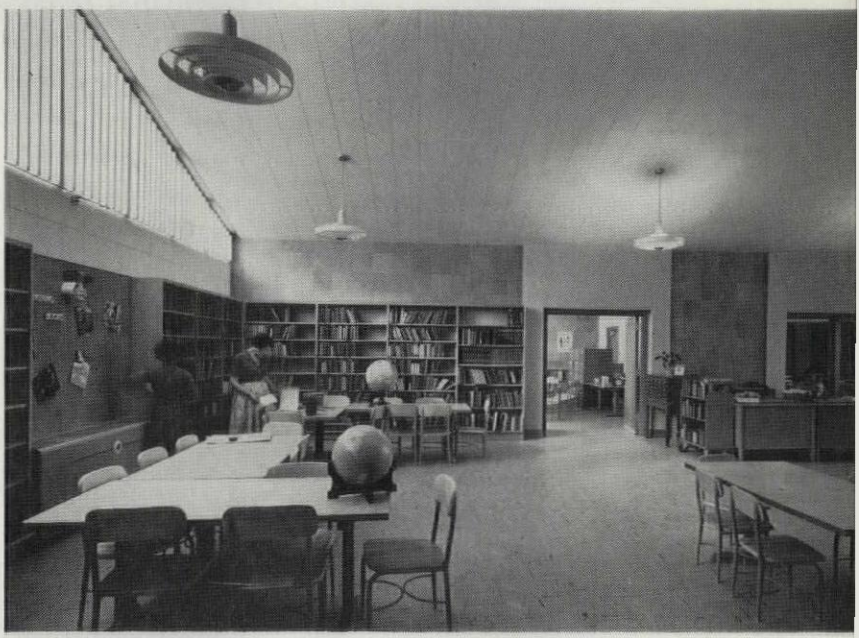
The typical classroom has high windows above the access corridor to the north (below) *and tall, south-facing windows. For darkening, louvers may be closed across upper areas, and roller shades take over below the southern louvers. Each room has a built-in bench* (*right of photo* below) *for use of student observers. Flooring is asphalt tile. Portions of the ceilings are surfaced with acoustical tile. Sash are aluminum; louvers, enameled steel.*





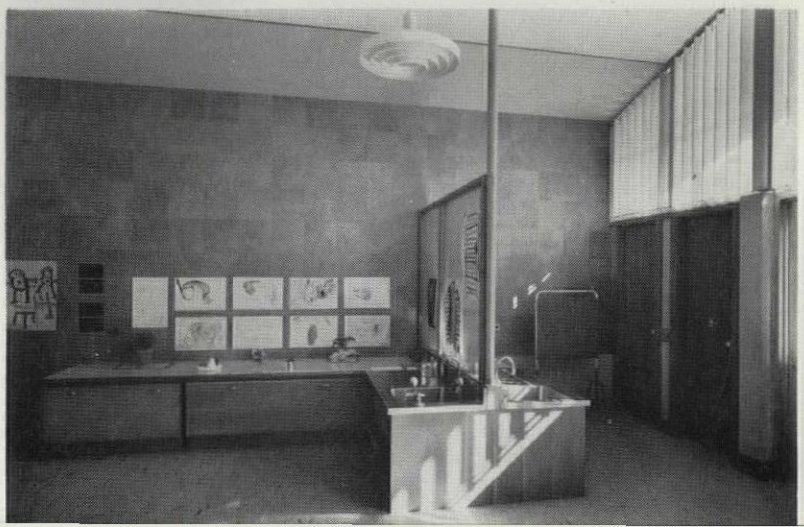
The concrete, three-hinged arches of the multi-use-gym (above) *become the pattern of the finished design; flooring is maple.*

The library (right) *is similar in design to the typical classroom and occurs at the main corridor end of one of the instruction wings.*





In kindergarten and primary units (above *and* right) *an enclosed corner under the roof projection on the south contains the individual toilets for the rooms. Inside are low work counters and a pair of work sinks. Note extensive use of corkboard on walls.*

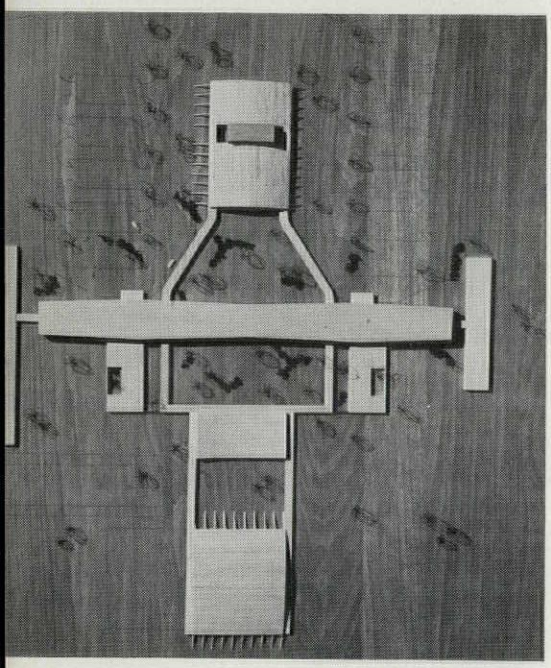


In considering the present status of design of public schools, whether elementary or high, one instinctively looks for some least common denominator; some trend that clearly distinguishes today's school buildings from those of the recent or distant past. Oddly enough—fortunately, from the profession's viewpoint—these are not immediately apparent. Every sort of plan type is found in the group of representative schools shown on the following pages, from the compact unit to the campus or cluster scheme. There is little evidence that the design of a good school for today can be, or is being developed, according to formula. The single-loaded corridor scheme is the answer in some instances; the scheme with classrooms on either side of a central corridor is the solution in others. And so, with every other aspect of plan and design.

One generalization that seems universally applicable to recent schools, which was certainly not the case in times past, is that today's schools are planned as efficient and gracious places for teaching and learning, rather than as civic monuments. And surely one of the reasons for this (in itself a fortunate design trend) is the invariable demand made on the school architect to produce more school for the money. Without exception, the architects with whom we have corresponded during the preparation of this issue have emphasized the limited budgets, on the one hand, and the requests, on the other, for complete contemporary facilities.

In design, this has required the greatest resourcefulness—in making one element or area perform two jobs; in keeping everything as simple as possible; in developing a convincing design expression from frankly exposed structural elements. Furthermore, since maintenance costs can be as difficult to meet as initial construction cost, one finds in every case the studied selection of durable materials that require a minimum of upkeep.

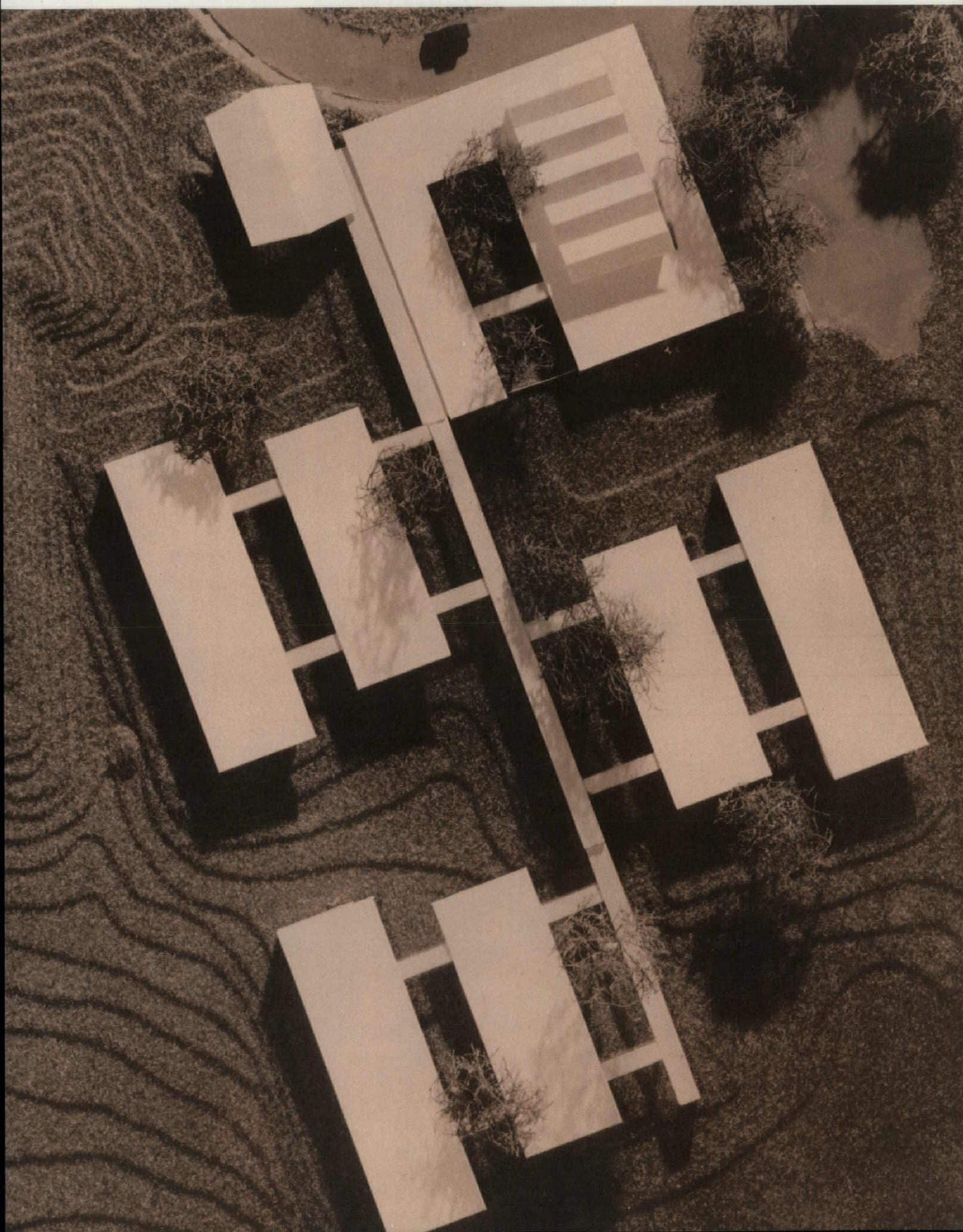
Within the bounds of these inexorable criteria, however, the architect can take heart that, hand-in-hand with progress in teaching methods and needs, there is still the widest choice possible in design approach. There are clearly numbers of possible answers to the common problem. In this liveliest field of practice, the architect can find full play for his talents, as well as an exceptional call on his ingenuity.

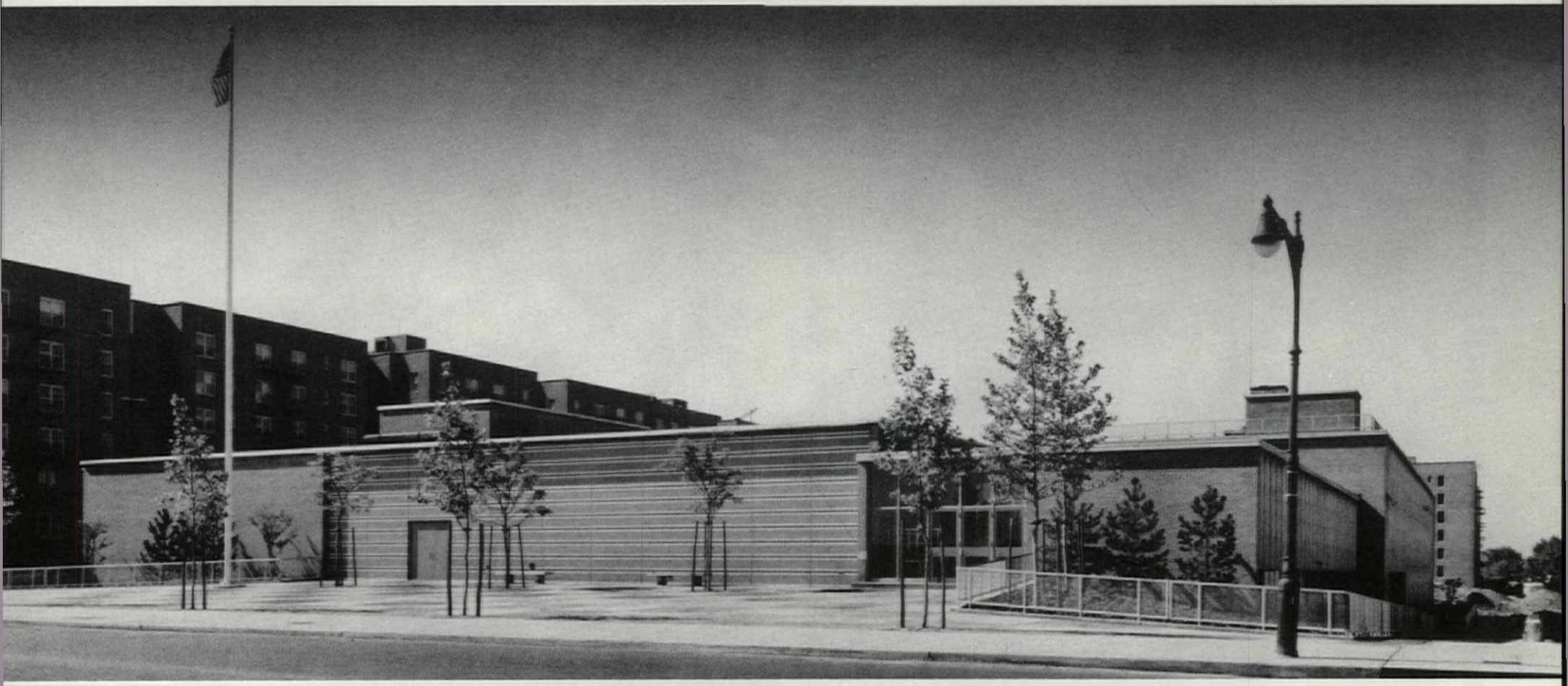


Junior-Senior High School to be built at New Orleans, Louisiana. Curtis & Davis, Architects-Engineers; Kamlah Johnson, Project Supervisor; Aubrey G. Code, W. B. Settoon, Walter E. Blessey, Structural Engineers; Cary B. Gamble & Associates, Mechanical-Electrical Engineers.

Model study for a proposed Elementary School, Birmingham, Michigan. Smith, Tarapata, MacMahon, Inc., Architects.

elementary and high schools





elementary school: New York, New York

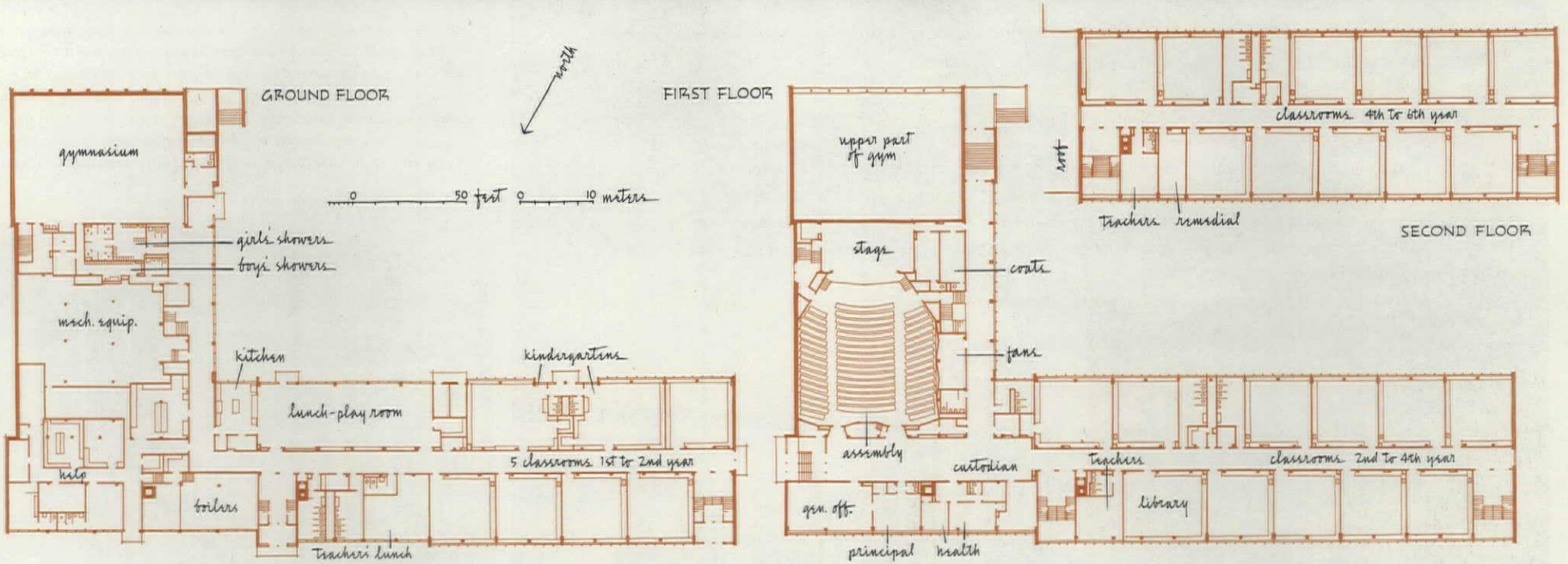
architect | William F. R. Ballard
landscape architect | A. Carl Stelling

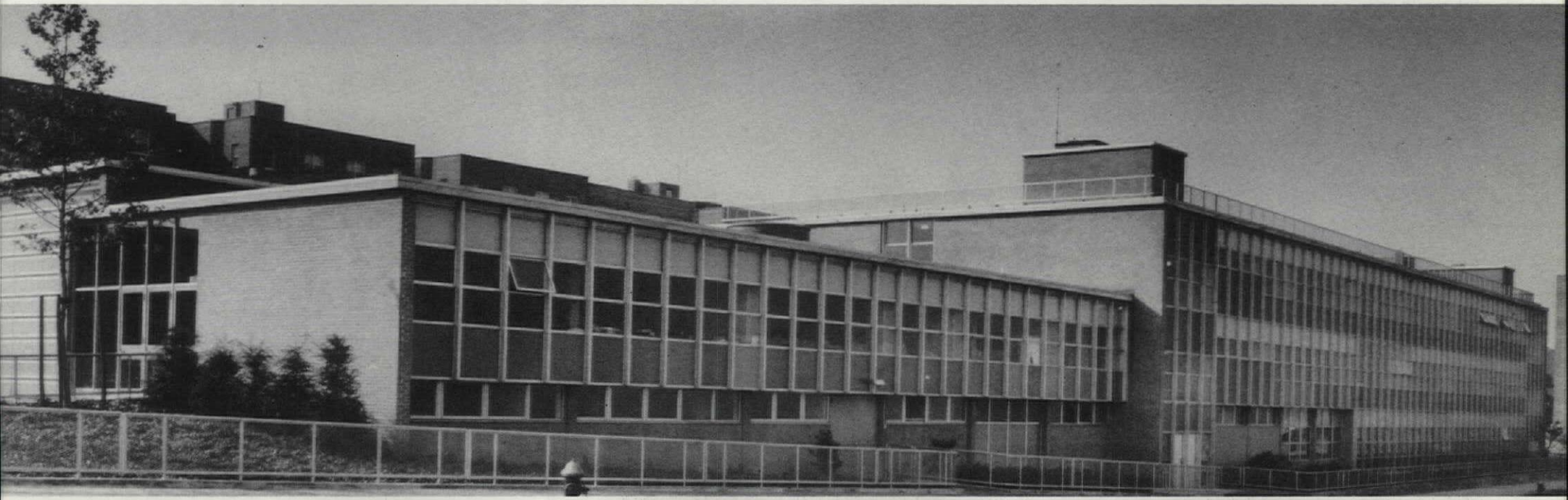
The big-city school must usually be jammed onto a hopelessly inadequate site, almost inevitably must be organized on several floors, and frequently results in a cramped plan and dour architecture. The 28-classroom Edward Mandel School (P. S. 220) in Queens, New York, is an encouraging exception. It sacrifices a bit of its full-block, 2½-acre site to permit an entrance plaza with grace notes of landscaping, color, and texture.

An L-Shape plan makes advantageous use of the site, sloping down from east to west. In the base of the L are the gym and auditorium and (at the corner) main entrance and administrative offices. The west-extending classroom wing has one floor of classrooms at the administrative level; two others—below and above.

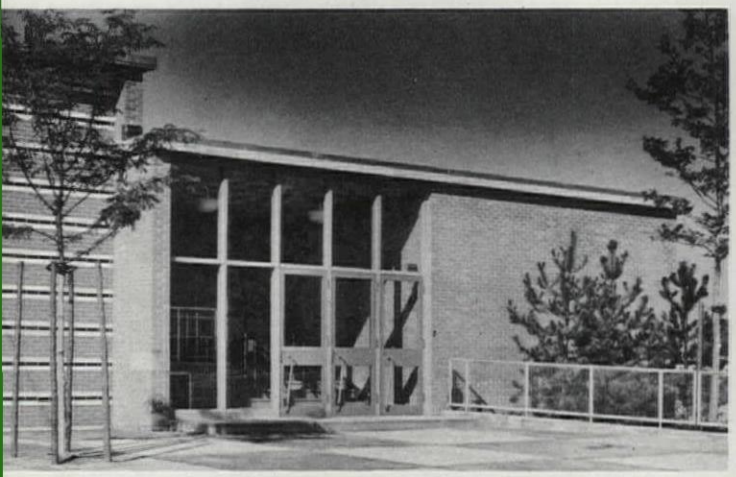
Built on concrete piling, the reinforced-concrete structure uses waffle-pan forms for grid flat-slab design which serves as finished design and also contributes acoustical values. Steel roof trusses occur only over the auditorium and gym. Exterior walls are either brick with block back-up or an aluminum-curtain-wall system.

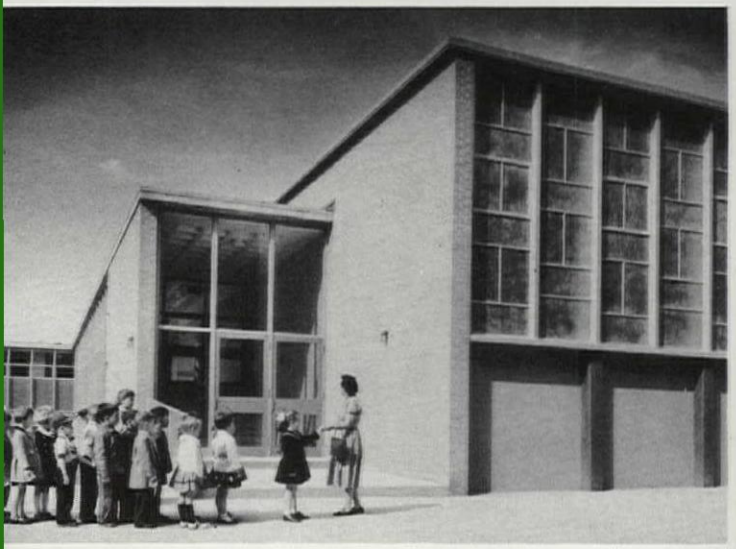
Structural Engineers: Fraioli-Blum-Yesselman; Mechanical Engineers: Lanier & Levy; Site Engineer: Ralph Eberlin; General Contractor: Caristo Construction Corp.


GROUND FLOOR
north
gymnasium
0 50 feet 0 10 meters
girls' showers
boys' showers
mech. equip.
kitchen
kindergartens
lunch-play room
5 classrooms 1st to 2nd year
toilets
Teachers lunch
FIRST FLOOR
upper part of gym
stage
coats
fans
assembly
custodian
Teachers
classrooms 2nd to 4th year
gen. off.
library
principal
health
classrooms 4th to 6th year
Teachers
remedial
SECOND FLOOR



elementary school: New York, New York





At left of entrance (top), *wall is of white, gray, and blue brick. Red brick of main wall is echoed in paving dividers.*

On the south side (above) *a secondary entrance occurs between the gym block* (right) *and classroom wing.*

The aluminum-grid wall of the classroom wing (right) *extends westward from lower corridor. Doors at grade lead to lunch room and kindergartens.* Photos: Gottscho-Schleisner

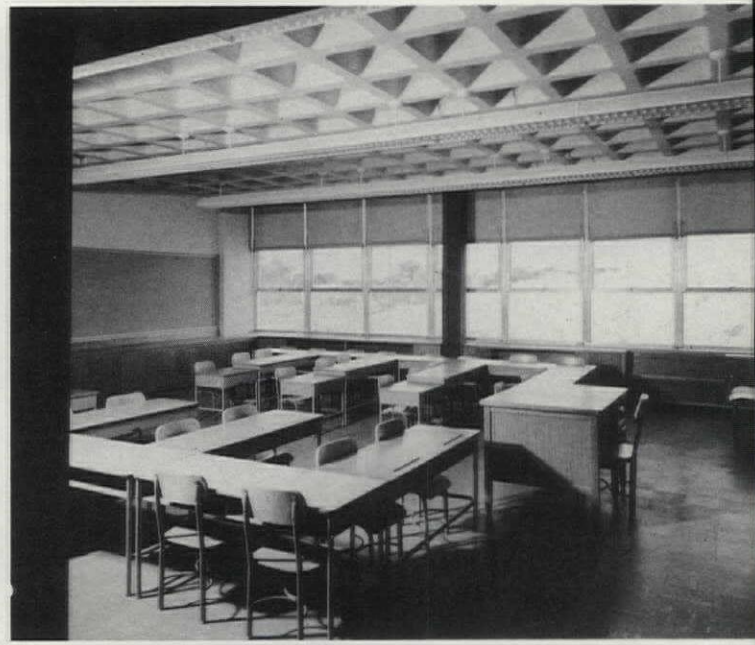




Cheery corridors have colorful mosaic tile, plastic-face block walls, and floors of asphalt tile.

Natural light filtrates the end of the gym (below left) *through translucent plastic, set in an aluminum grid.*

The typical classroom (right *and* below) *has wall-to-wall windows, waffle-pan ceiling, fluorescent lighting, and asphalt-tile flooring. For heating, an oil-fired steam system serves finned radiation.*









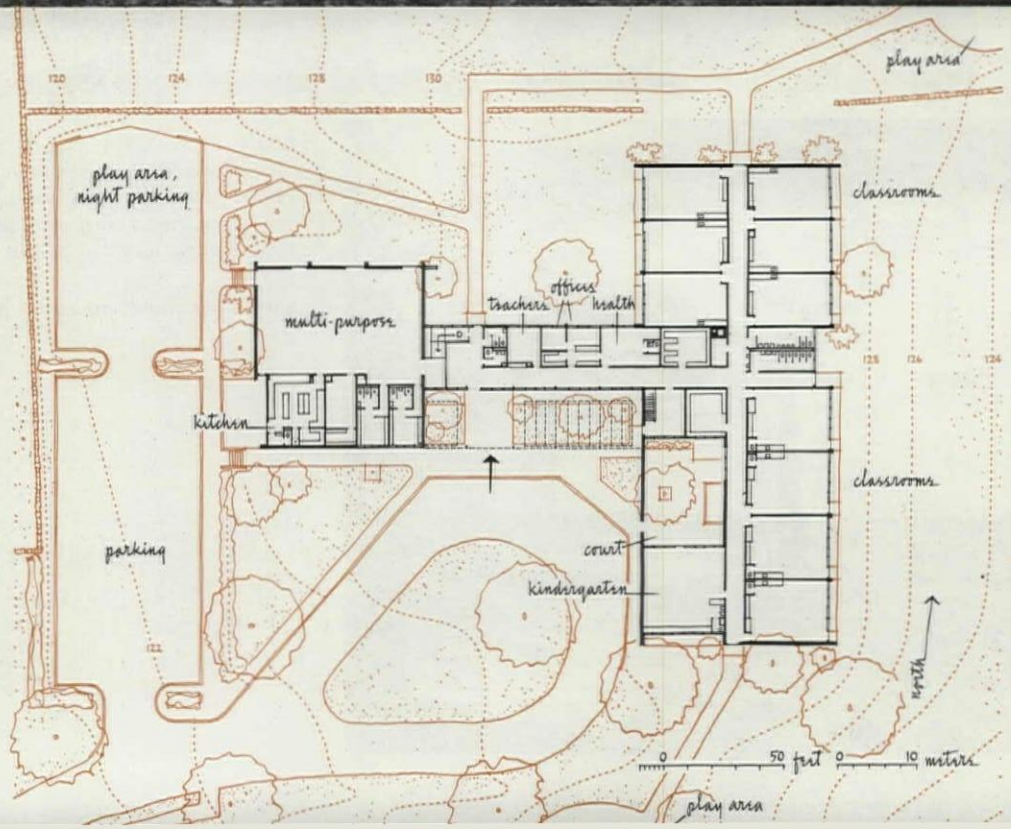
elementary school: Bantam, Connecticut

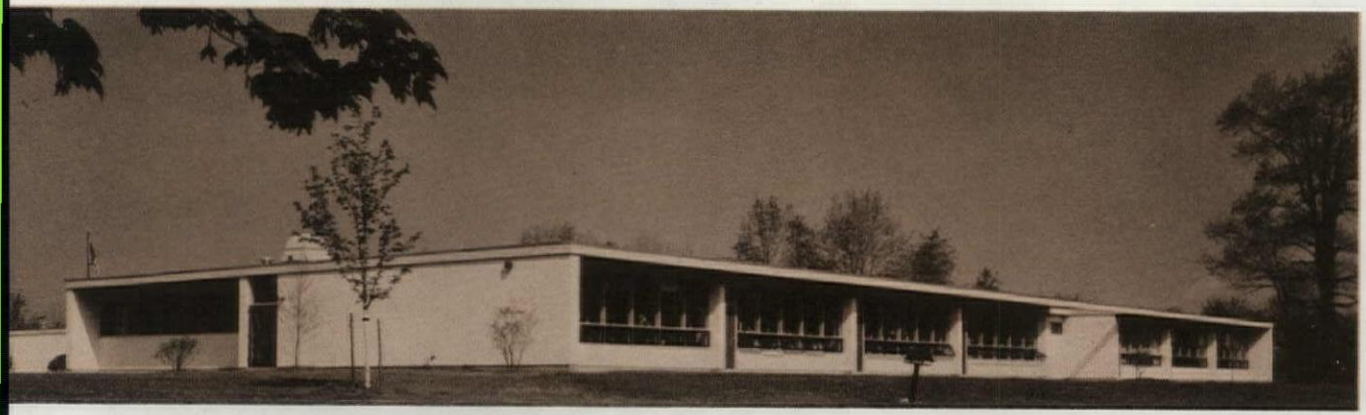
Economy was the watchword in the design of this rural school containing ten primary classrooms, a kindergarten, and a multipurpose room. Basic scheme for the plan consists of two major elements—classroom wing and common-use area – joined by a narrow neck in which the lobby, offices, and health room are located.

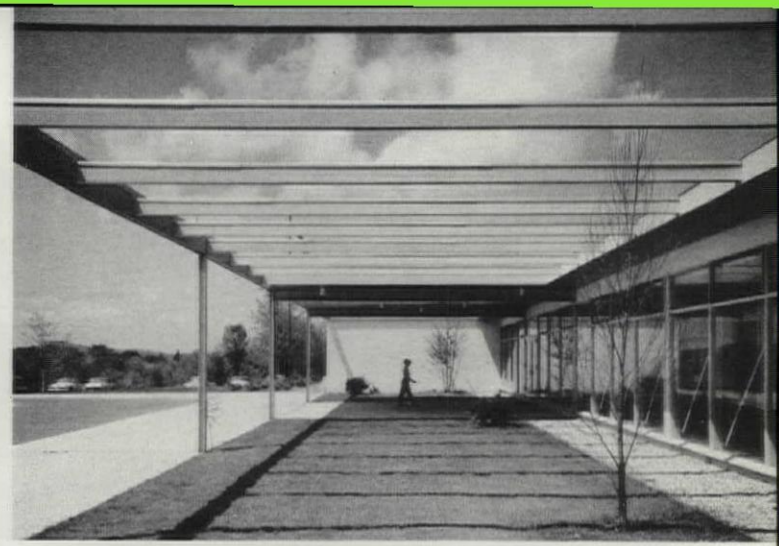
A fundamental ingredient in structural economy was adoption of a one-story scheme, which was considered most practical for children of elementary-school age in any event. This allowed the optimum relationship between classrooms and outdoors; and organization of rooms with their short dimensions adjacent to the corridor further cut construction costs.

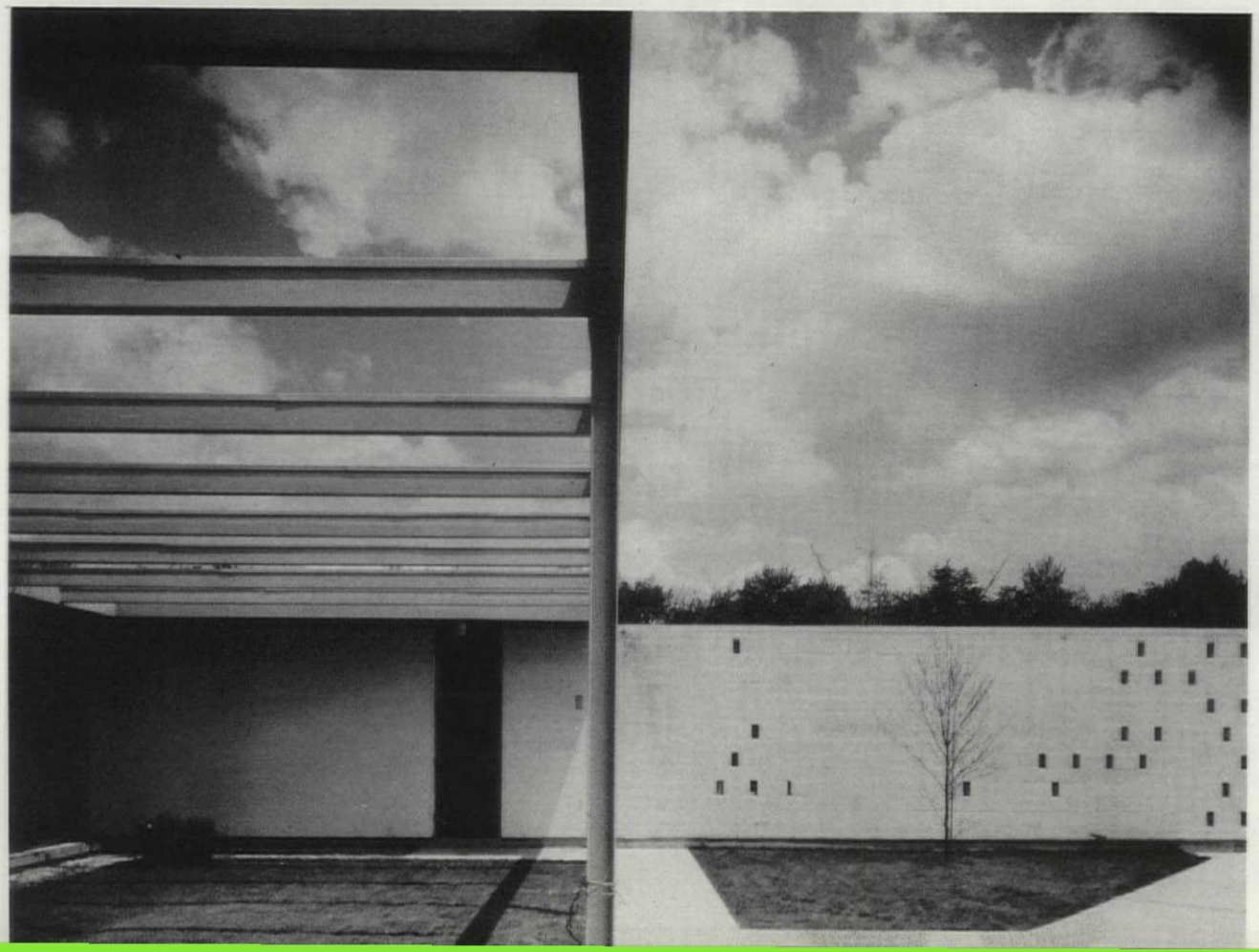
The structure is of lightweight concrete-block bearing walls with laminated-wood girders and beams supporting the roof. Flooring is mainly asphalt tile, though maple with gymnasium finish is used in the multipurpose room. Interior block walls are unpainted and exposed. Laminated beams have a natural finish. Color accents occur in soffits painted bright vermilion and in classroom bulletin boards that are variously blue, red, or yellow.

Fluorescent lighting is used throughout. An oil-fired, hot-air system, using underfloor ducts and registers near outside walls, heats the building. Structural Engineers, General Engineering Associates; Mechanical Engineers, Fred S. Dubin & Associates; General Contractor, Bonvicini Building Company, Inc.





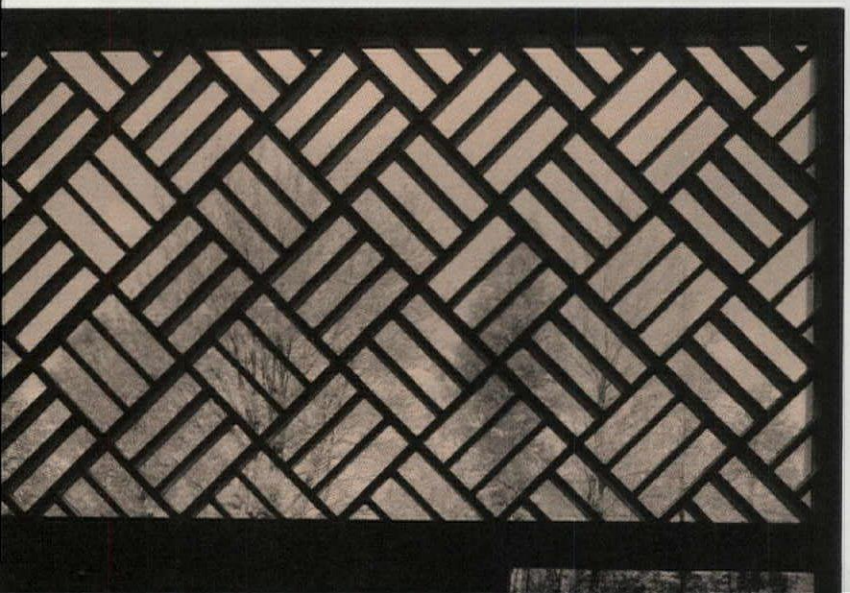


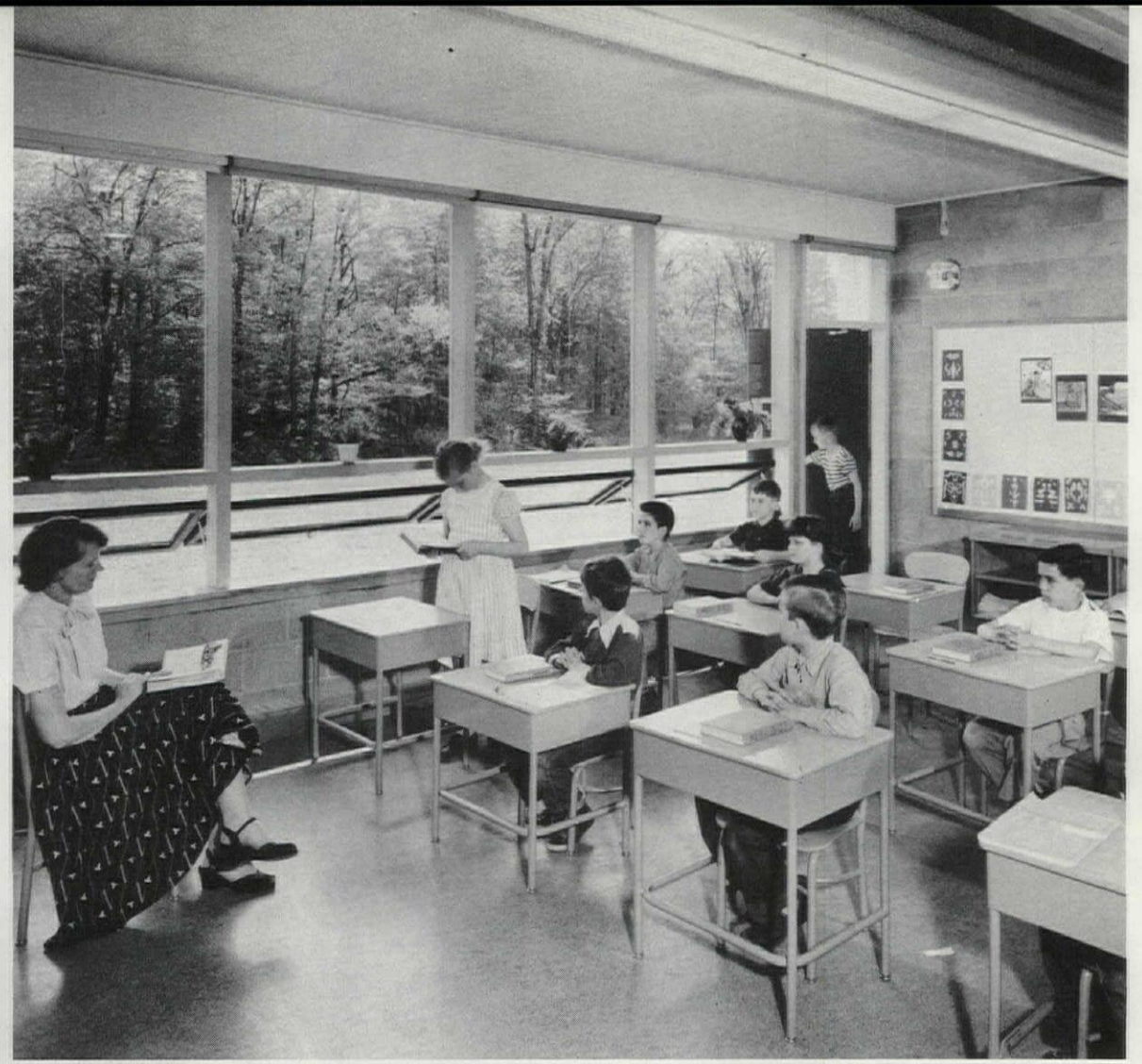


architects associated	Marcel Breuer and O'Connor & Kilham
design associate	Herbert Beckhard
job captain	Richard deRham
landscape architect	Bryan J. Lynch

elementary school: Bantam, Connecticut







From each of the classrooms (above), *a door opens to the outside. Sash, combining fixed panels and pivoting units, are of wood. For acoustical control, ceilings are finished in random-perforated cane-fiber tile. Artificial lighting is from 8-ft, surface-mounted fluorescent fixtures.*

Sliding wood doors can open the multipurpose room (left) *to the outdoors. Sky glare is tempered by a decorative wood screen. Dome-reflector incandescent units provide artificial lighting. Flooring is maple.*

Photos: Ben Schnall

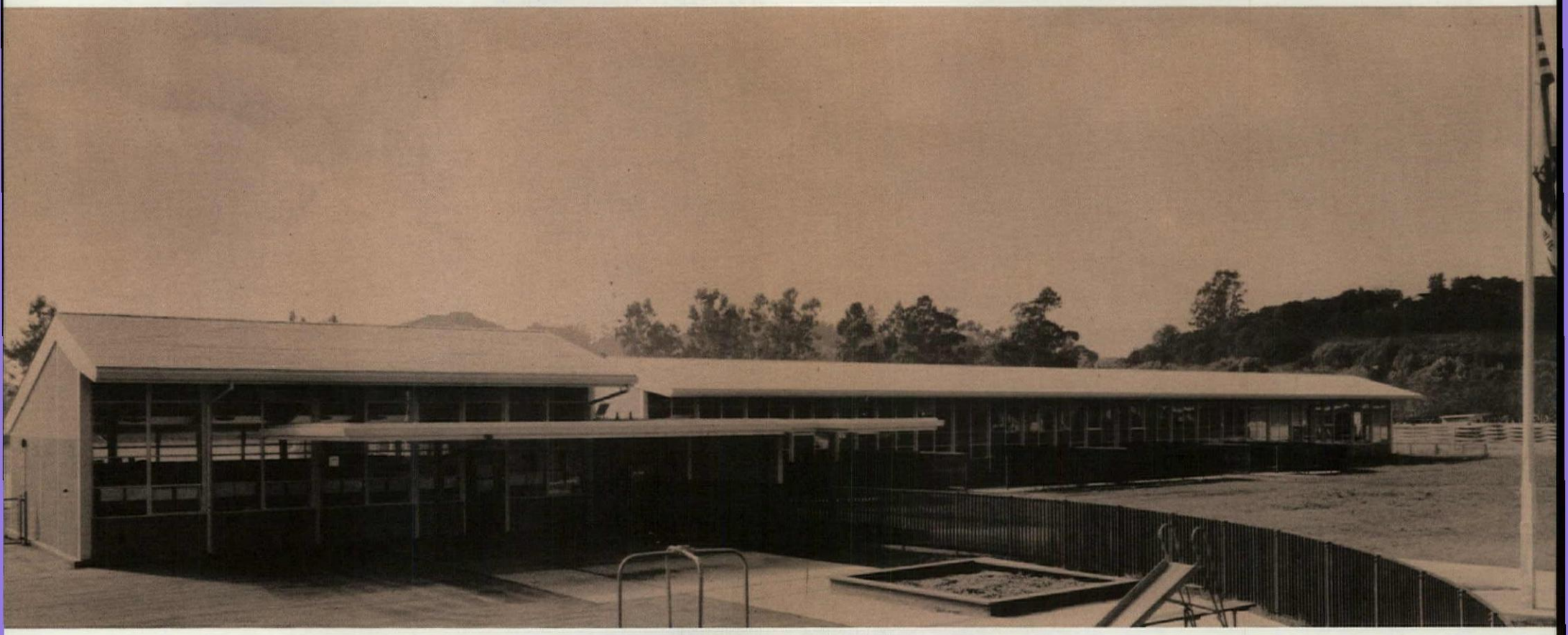


The glazed corridor (right), *leading back from the main entrance doors to the classroom wing, faces south and is bordered by a trellised and landscaped forecourt. Light fixtures: single-line, continuous fluorescent units.*

The kindergarten (below right) *has an adjoining walled and landscaped play yard* (below) *that more than doubles usable space.*





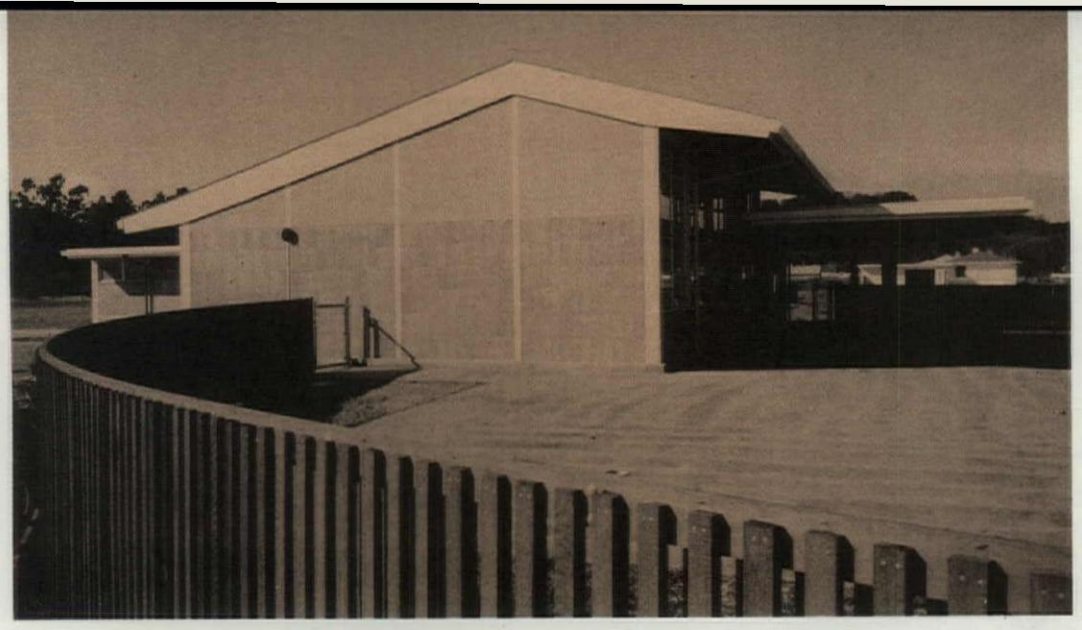


elementary schools: Napa, California

As the plans and sections on the following spread demonstrate, here is a remarkable instance of two schools, identical in floor plan, being built in the same community on dead-level sites having completely opposite orientation. The structural method and its use in reverse provide the key to the solution. Photographs shown are of the school that faces north, with tall windows on this side, and deeply sheltered access walks to the rear. In the other school, the high wall occurs at the back, and access walks are on the street front. Initial buildings (both are planned for expansion) consist of six classrooms, kindergarten, and administrative area.

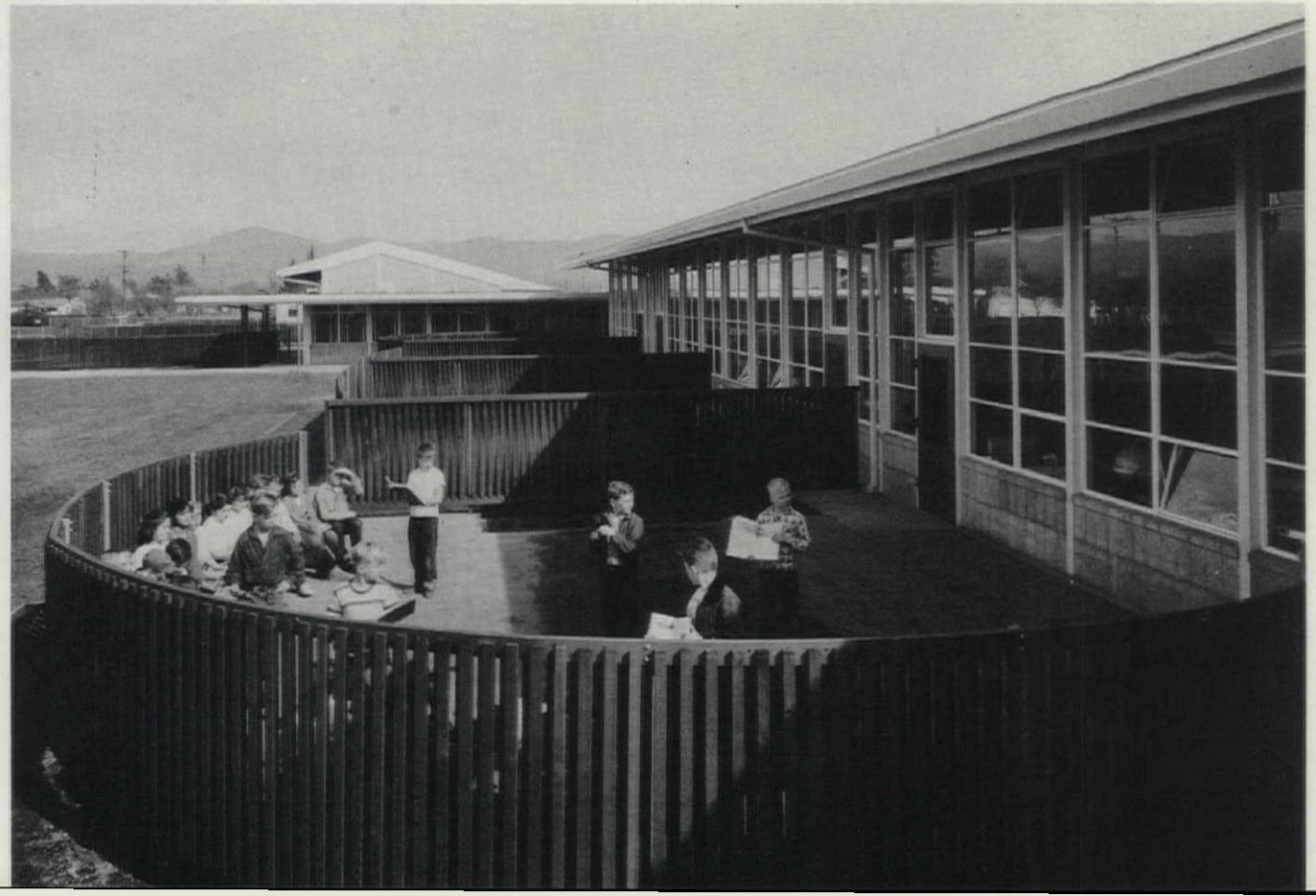
Designed for fire and earthquake resistance and minimum maintenance, structure of both schools consists of plant-fabricated concrete-block panels in steel channel frames stressed with steel rods, joined to field-welded channel frames that form 8-ft o.c. columns carrying exposed steel roof bents. Speed of erection was another advantage of the system, and cost per square foot came to but $10.81.

John M. Sardis was Civil-Structural Engineer; James Gayner, Mechanical Engineer; Herbert A. Crocker Co., General Contractor.

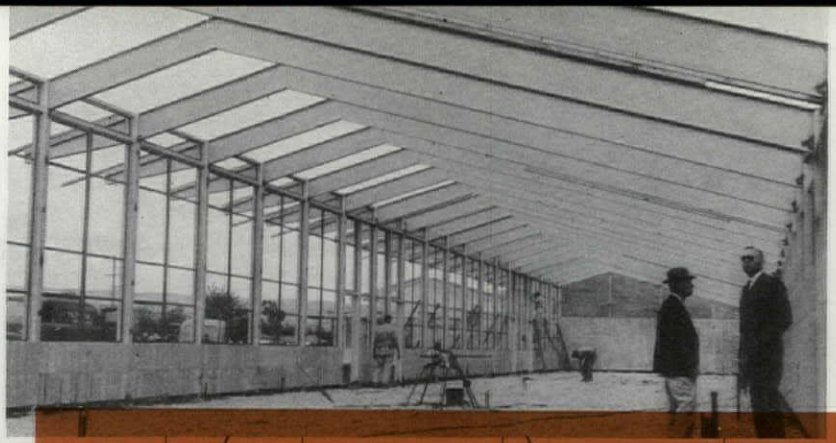


architects	Corlett & Spackman
associate-in-charge	Peter H. Skaer
landscape architects	Eckbo, Royston & Williams

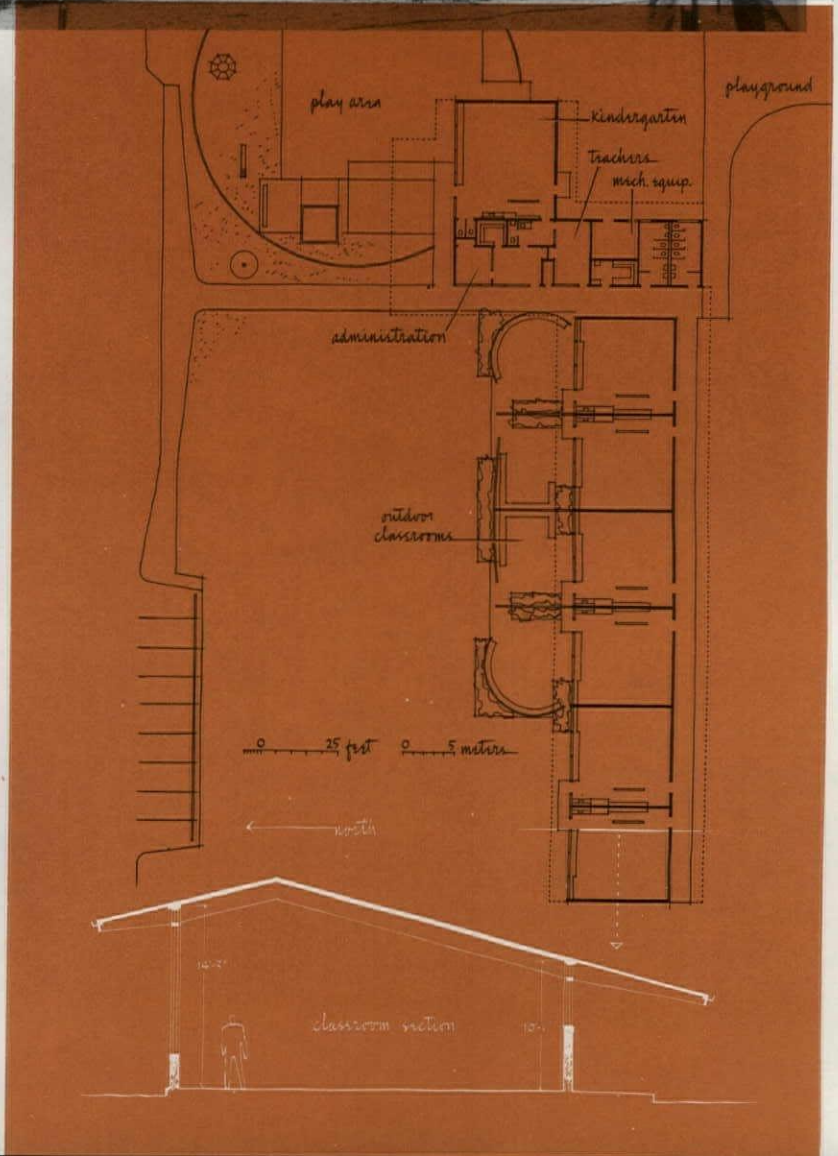
The site is so schemed that each class, as well as the kindergarten, has its own outdoor instructional or play area. Sash are of steel; on roof slopes, roofing is asbestos shingles above a layer of insulation board. Photos: Rondal Partridge



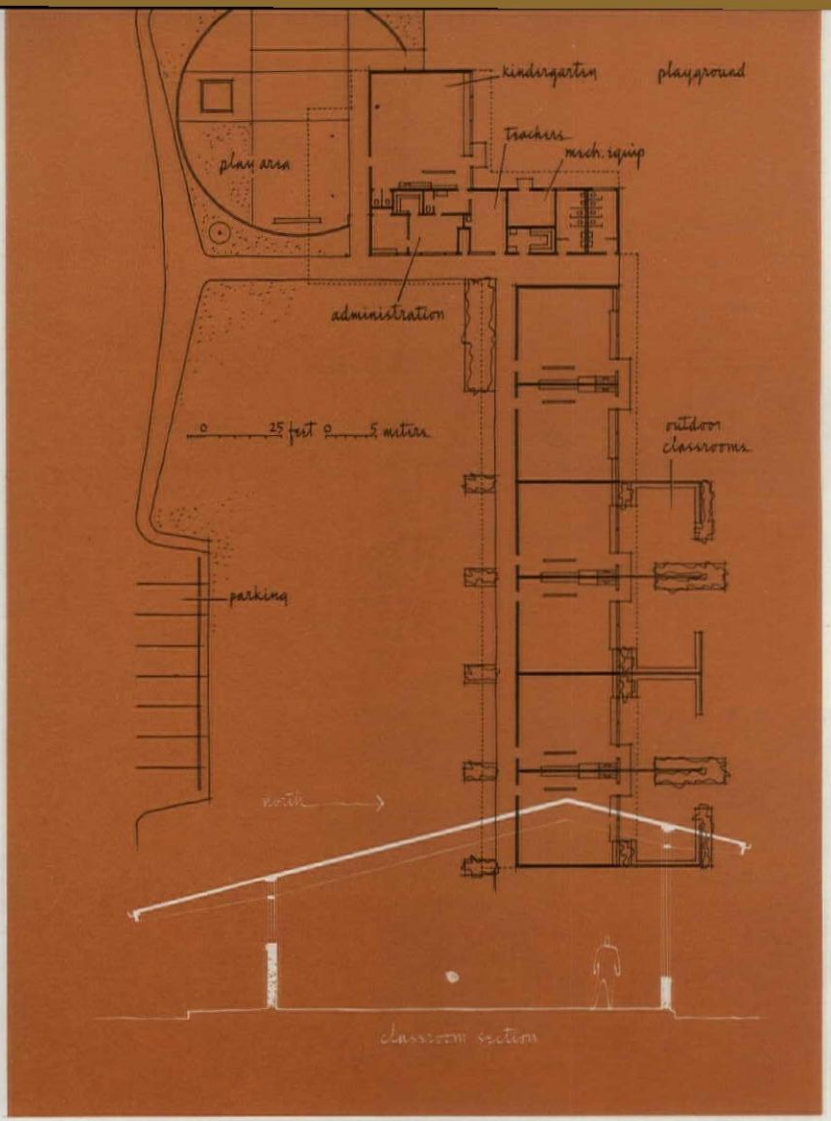
elementary schools: Napa, California



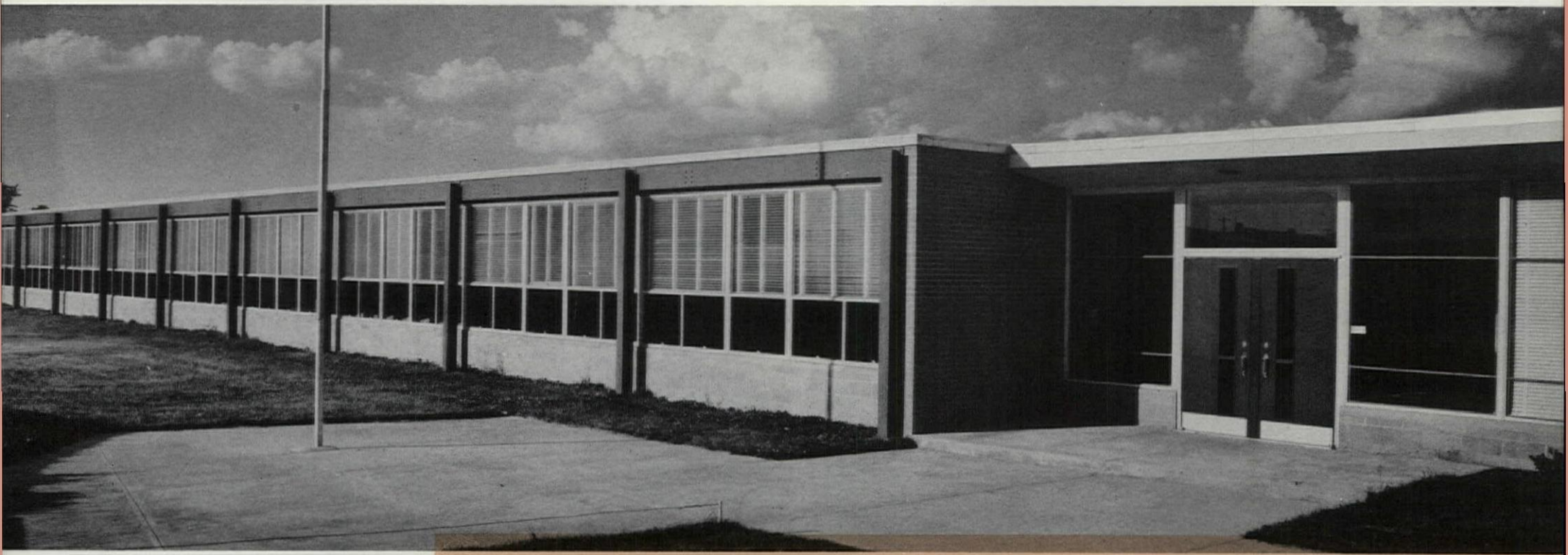




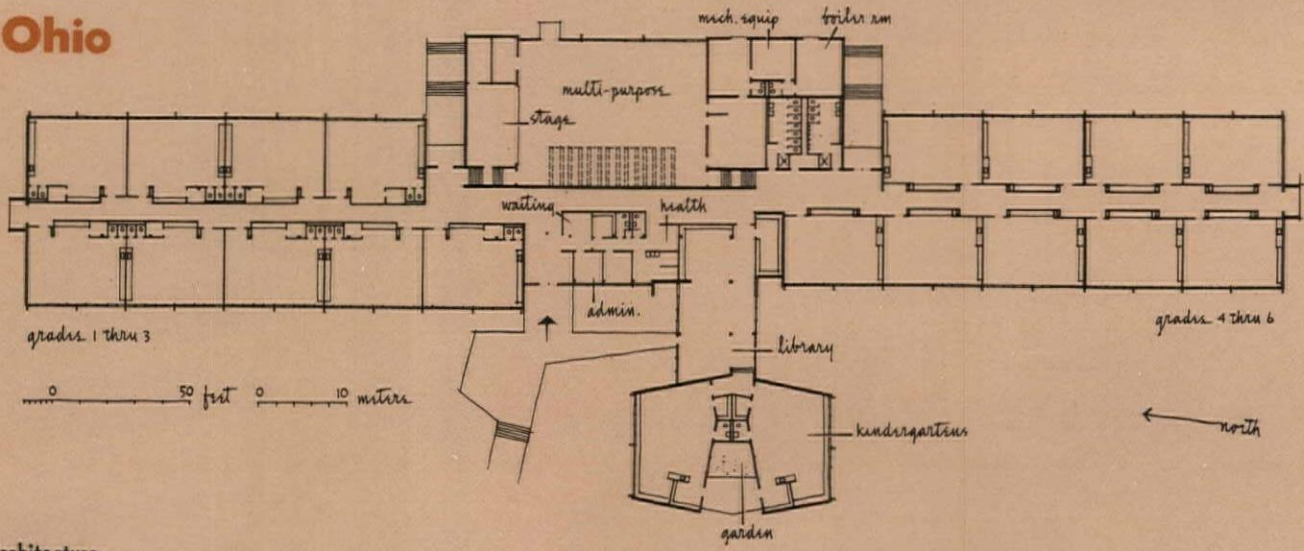




Whichever school is considered, the bilaterally lighted classrooms have high windows facing north, and strip windows on the south wall up under the roof of the bordering walkways. Perimeter walls are either windows or exposed concrete-block panels; partition walls have plywood finish. Random-pattern acoustical tile is applied directly to portions of the exposed 2"x8" roof sheathing. Flooring is asphalt tile on concrete slab that contains radiant-heating coils.



elementary school: Madeira, Ohio



consulting engineers | A. M. Kinney, Inc.

architect | Charles Burchard, Director of Architecture



Since the local School Board had a maximum construction budget of $430,000, yet wanted a school with two kindergartens, three classrooms each for Grades 1 through 6, a multipurpose room, and offices, the architects for this school had to do everything possible to keep the budget and needs in balance. The final construction cost came to $429,872. This performance is largely attributable to three astute decisions:

1. For this class of construction, the Ohio Building Code requires that all interior columns be fireproofed to the ceiling line—though girders and beams need not be similarly fireproofed. To avoid the cost of column fireproofing, the architects decided to put the steel structural cage of the building on the outside. This not only effected its basic purpose but also cleared the classroom walls of structural projections and gave the design its modular rhythm.

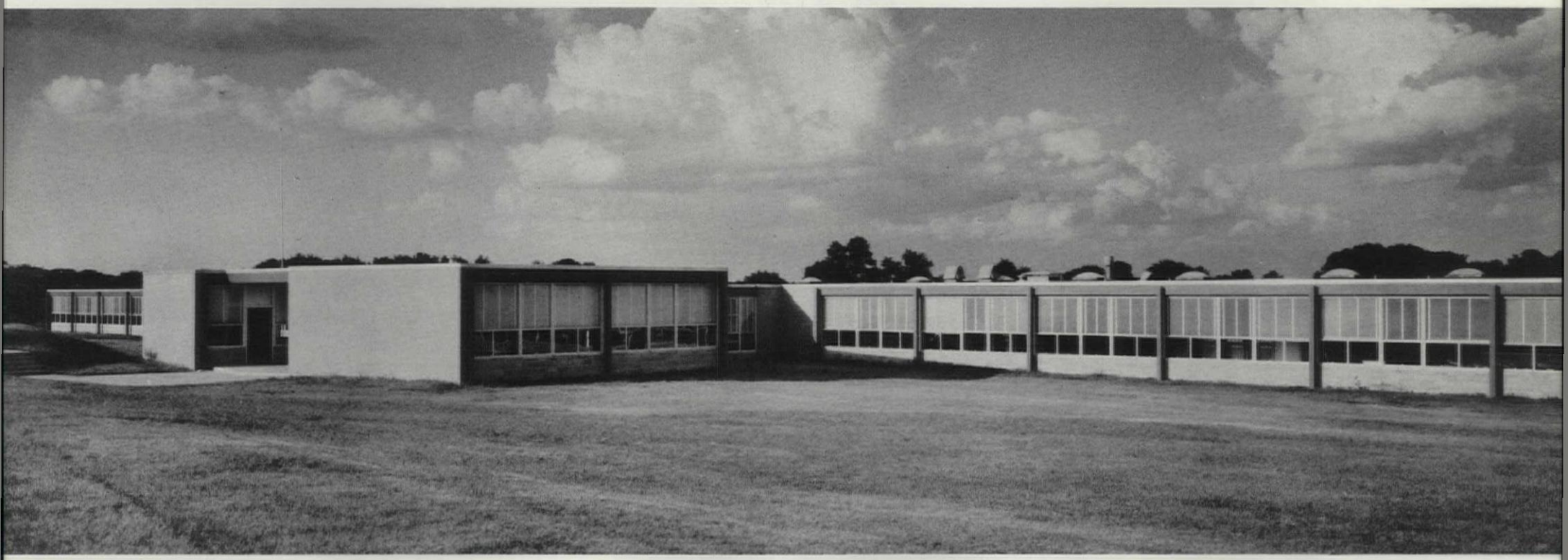
2. The roof design was worked out with poured gypsum supported on glass-fiber formboard on tees. The glass-fiber material provides insulation and acoustical properties, as well as forming.

3. Corridor space is kept to a minimum total—wider than the usual school corridor around classroom entrances where groups congregate, but reduced to 6 feet in width in purely passage areas.

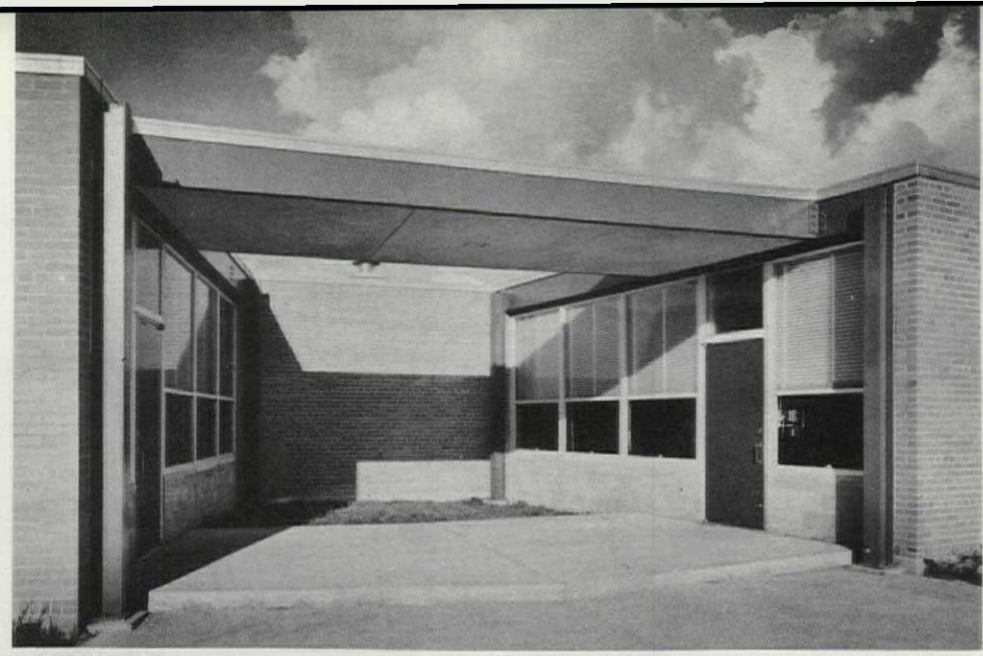
On both front and rear façades, the continuous classroom block is interrupted by projecting elements—the paired kindergartens with their private court and entrances on the front; multipurpose room and auxiliary spaces to the rear. Exterior walls are of brick, except under window areas, where painted concrete block is used. Heating is accomplished by an oil-fired, hot-water system, with individual room-temperature control. Artificial lighting is fluorescent in the classrooms, with fixtures attached at right angles to the exposed structural steel beams. Incandescent units are used in the multipurpose room, library, and offices.

Color is an important part of the exterior design, with the exposed steel columns painted an intense blue; the concrete block under the windows, mustard yellow; and the steel, projected sash, yellowish gray. The brick is red face brick.

General Contractor was H. W. Miller Construction Company.



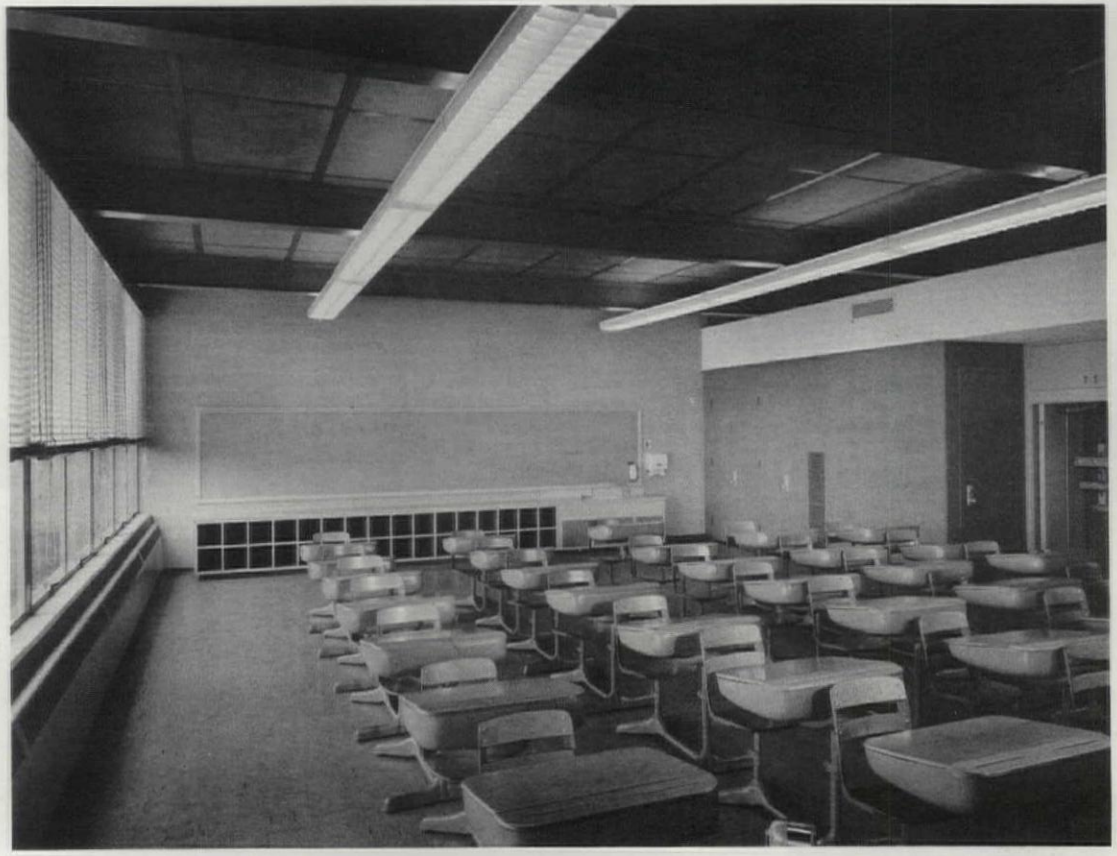
elementary school: Madeira, Ohio



The paired kindergartens have their separate entrances, either side of a small courtyard. Along with the rooms serving Grades 1 through 3, kindergartens have their own toilet facilities.

Photos: Joseph W. Molitor

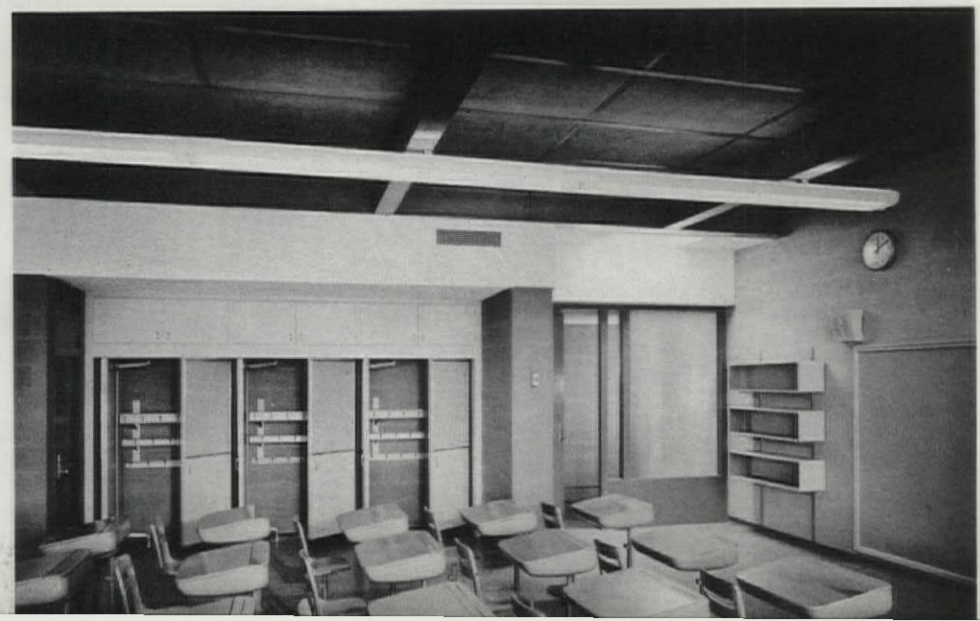


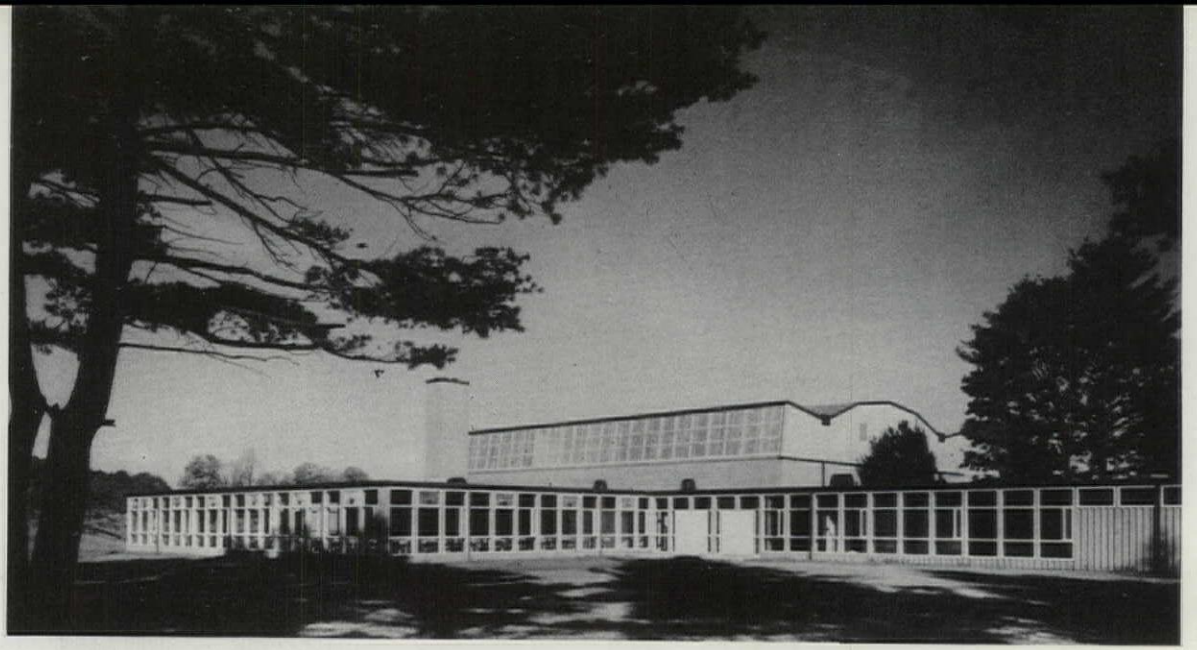




Long-span joists support the roof of the multipurpose room (above right). *Concrete block walls are blue and gray, and the joists are painted an intense yellow.*

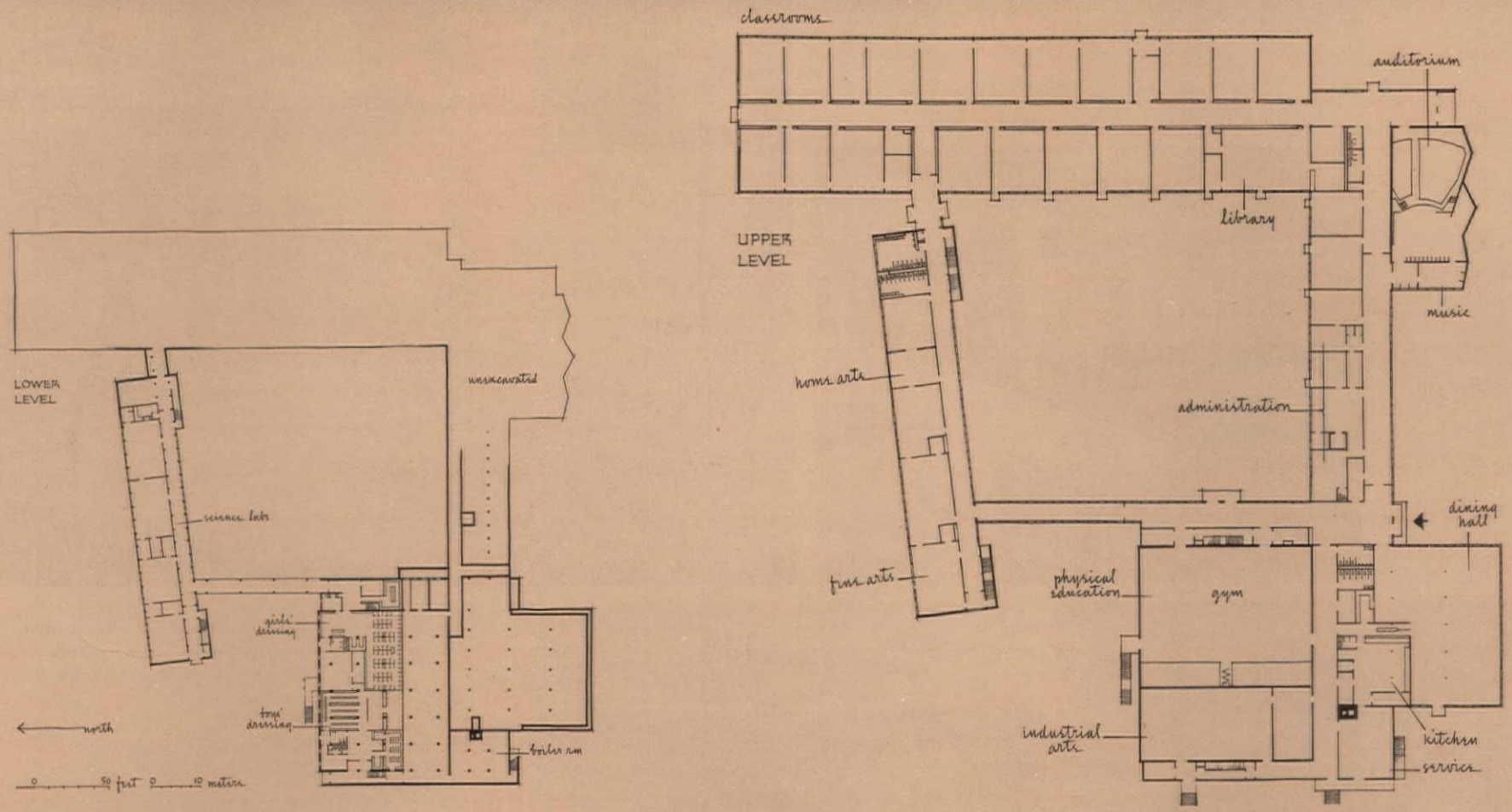
In the typical classroom (above *and* right) *structural elements constitute the finished design—block partition walls; steel beams; tees supporting the glass-fiber formboard that, in turn, supports the poured-gypsum roof. Ceiling steel is painted blue, while walls are a warm gray, and color accents of red and yellow occur in cabinet doors.*





high school: Sudbury, Massachusetts

Anderson, Beckwith & Haible, Architects



The Lincoln-Sudbury Regional High School currently accommodates 650 students, but the plan was developed with a view to future capacity of 1500. The gymnasium unit, for example, is large enough for the eventual enrollment, with the removal of the present Industrial Arts Department to a new unit. The present library will become two classrooms, and a new library will be built. A school auditorium is scheduled when the student total reaches 1000.

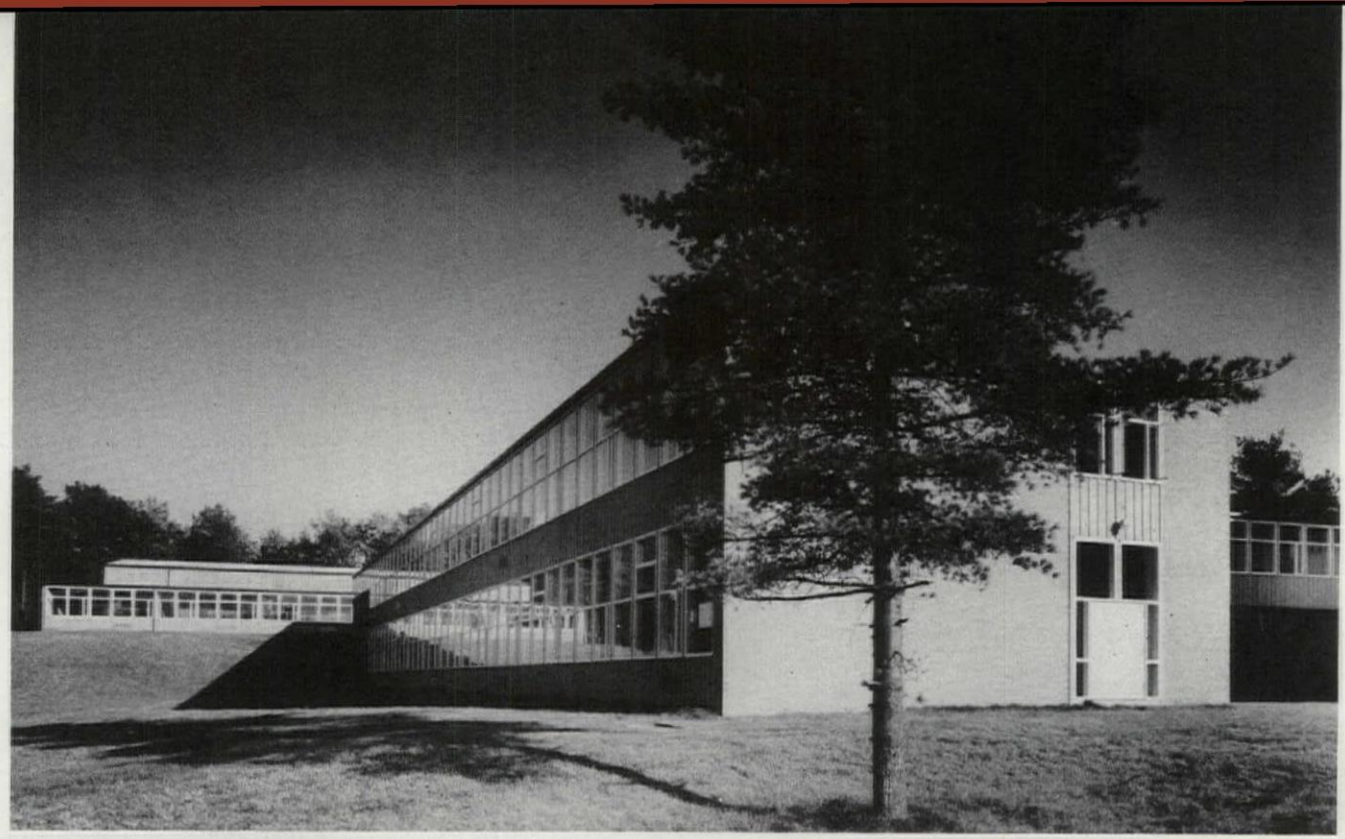
The partly wooded, partly cleared site is 72 acres in extent, and the school is placed on a sloping part of the land, so that spaces where mechanical features are less concentrated occur in one-story units, while those requiring many mechanical features are in a two-story wing. A bridge joins the one-story element to the upper floor of the two-level wing at the rear, and an amphitheater occurs within the courtyard.

Structurally, the building is reinforced concrete below finished floor of the main floor and structural-steel framing with metal-roof decking above this grade. The module is 4′-6″.

A large proportion of the exterior walls is of 4′-6″ wood panels, removable and reusable in areas where future additions will occur; other wall areas are brick with cinder-block backup. Flooring, in general, is asphalt tile, though maple is used in the gymnasium. Partitioning is of cinder block; sash are steel, and the heating system combines steam, hot water, and hot air.

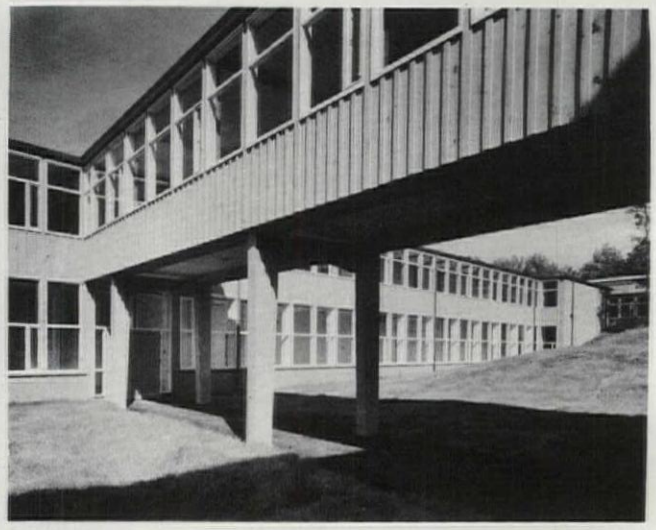
Educational Consultants were Dr. Herold C. Hunt, Dr. Rexford Souder, and Douglas Roberts. Structural Engineers, Cleverdon, Varney & Pike; Mechanical Engineers, Slocum & Fuller; Electrical Engineer, Edwin Mahard; Acoustical Engineers, Bolt, Beranek & Newman; Clerk of the Works, Robert F. Scofield; and General Contractor, J. F. Rand & Son.

high school: Sudbury, Massachusetts

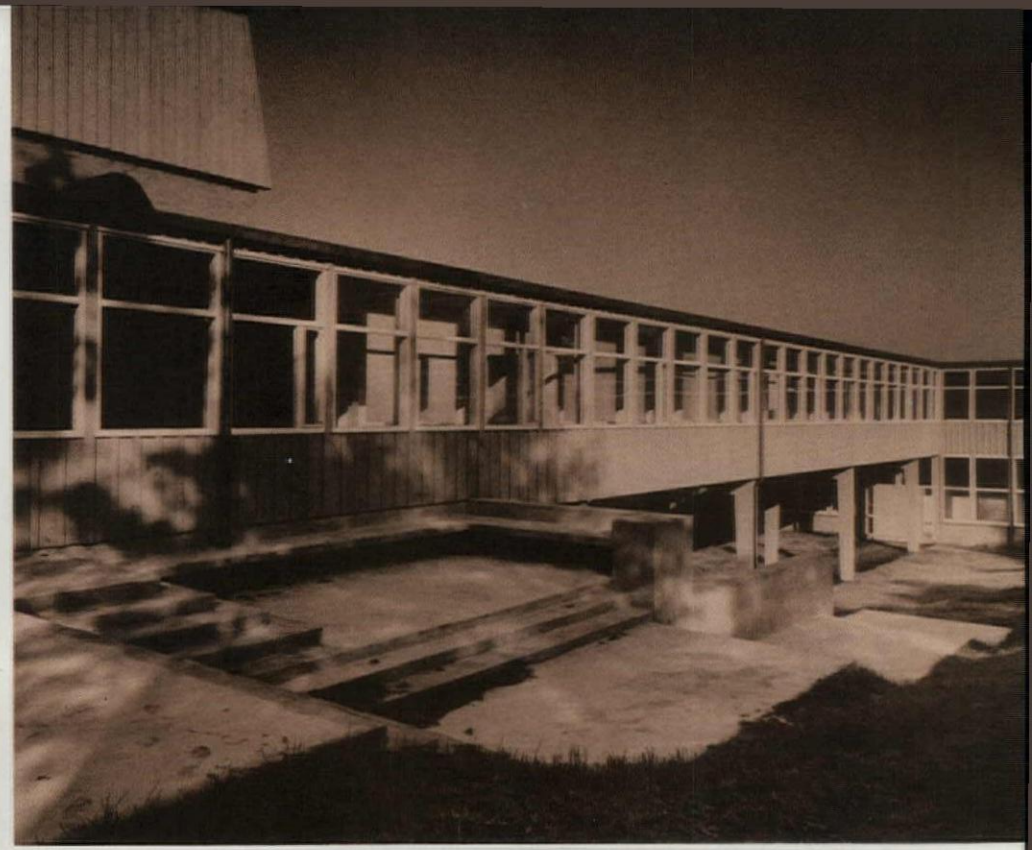


Elements of the school building are organized around a central courtyard, where the slope of the land forms a natural amphitheater. Board-and-batten wood panels are the chief exterior wall material; sash are steel. Photos: Louis Reens



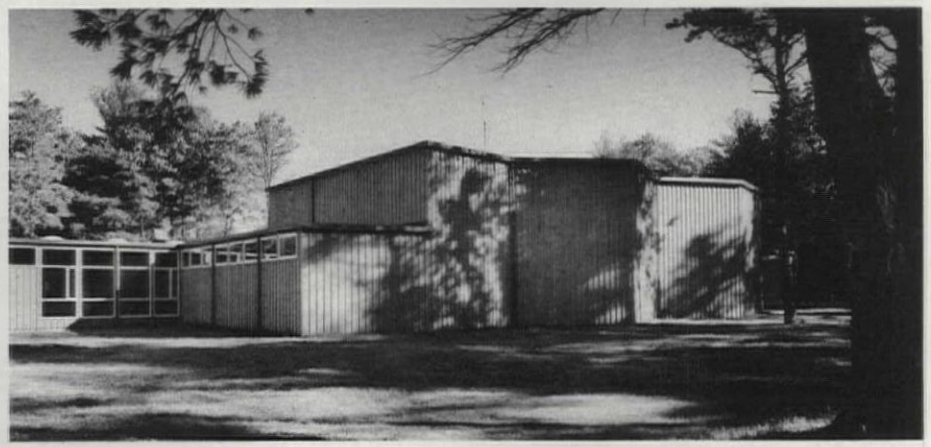






The one-story classroom wing (right *and* below) *has rooms at either side of a central corridor and clerestory lighting to supplement the windows.*





The odd shape of the music and drama wing provides acoustical correction; the stage of the future auditorium will adjoin this wing so that both can be used as a unit.

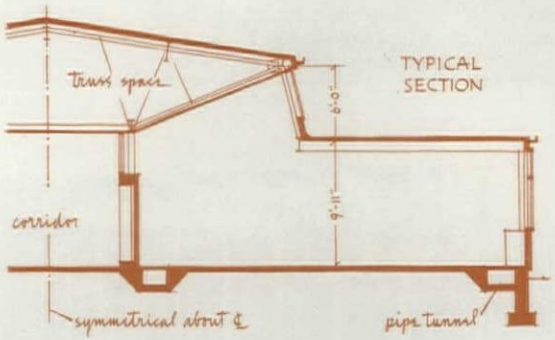
high school: Sudbury, Massachusetts



Clerestory of the gymnasium is "glazed" with translucent, corrugated plastic. Flooring is maple.

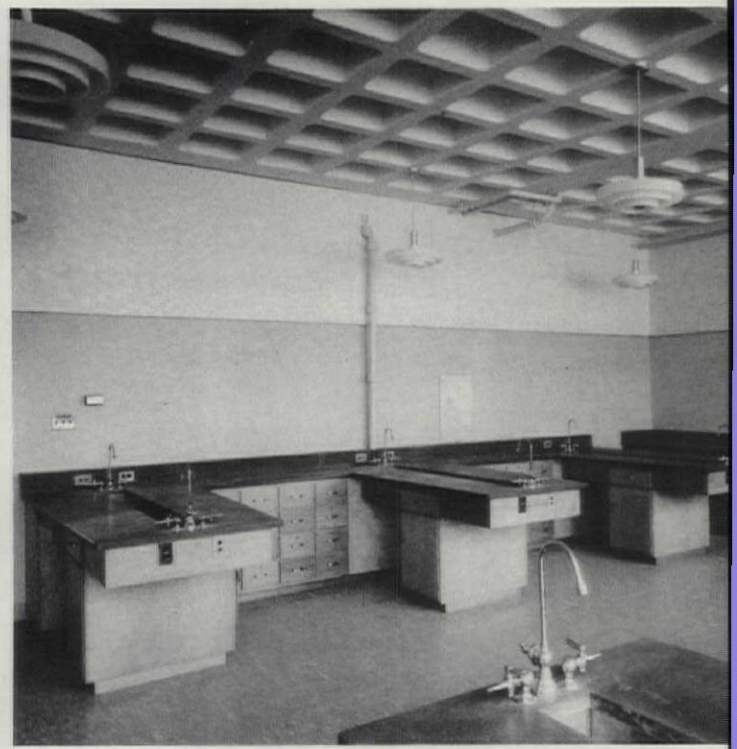
The dining hall (below) *has floor-to-ceiling windows on three walls; exposed steel frame, acoustical-tile ceiling, concentric-ring lighting fixtures, and asphalt-tile floor complete the pattern.*







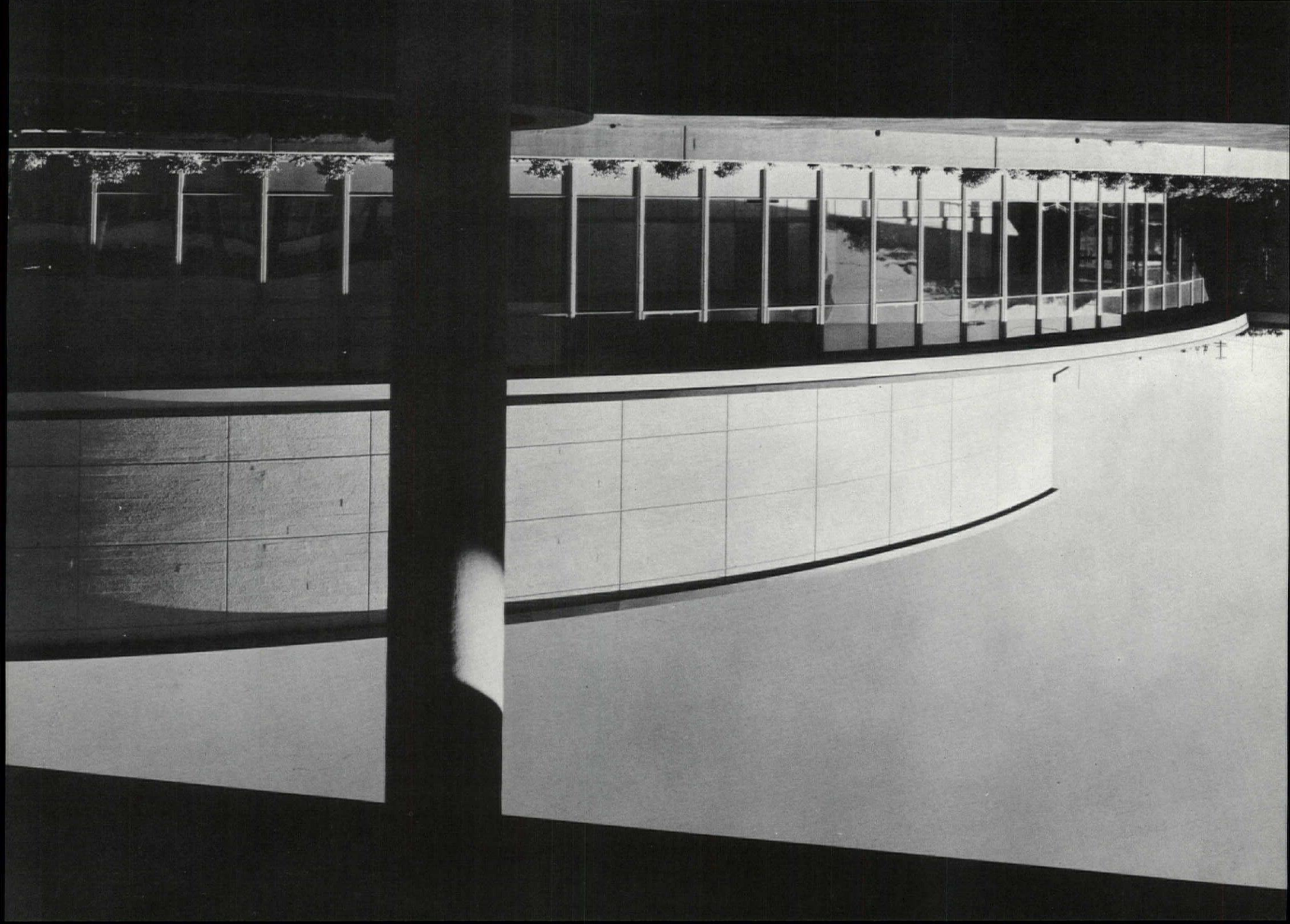




The modular pattern of 9-ft bays is emphasized in the corridor beside administrative offices (top) *by the exposed steel frame.*

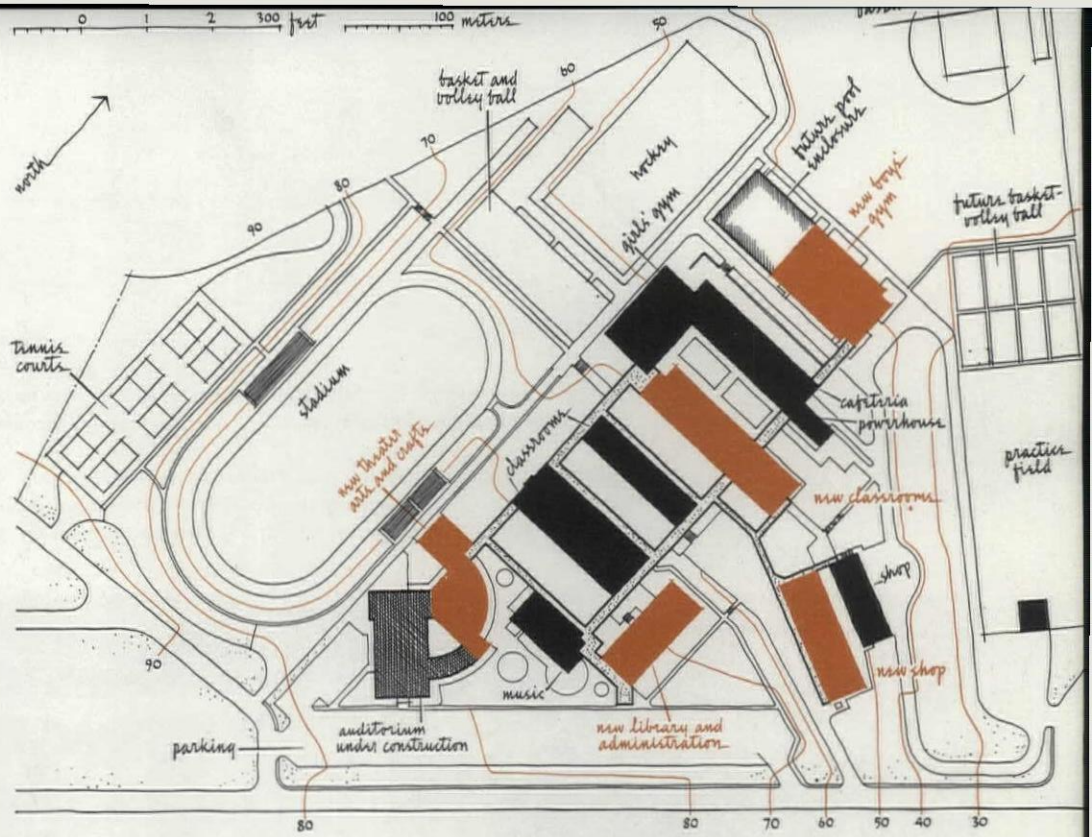
Science labs (above) *are at ground level in the two-story wing.*

The one-story classroom wing has a center truss supported approximately at the one-third points, the columns occurring at either side of the corridor; ends of the truss are above the main roof level and provide a clerestory, filled with corrugated plastic.



high school: San Bruno, California

John Carl Warnecke, Architect



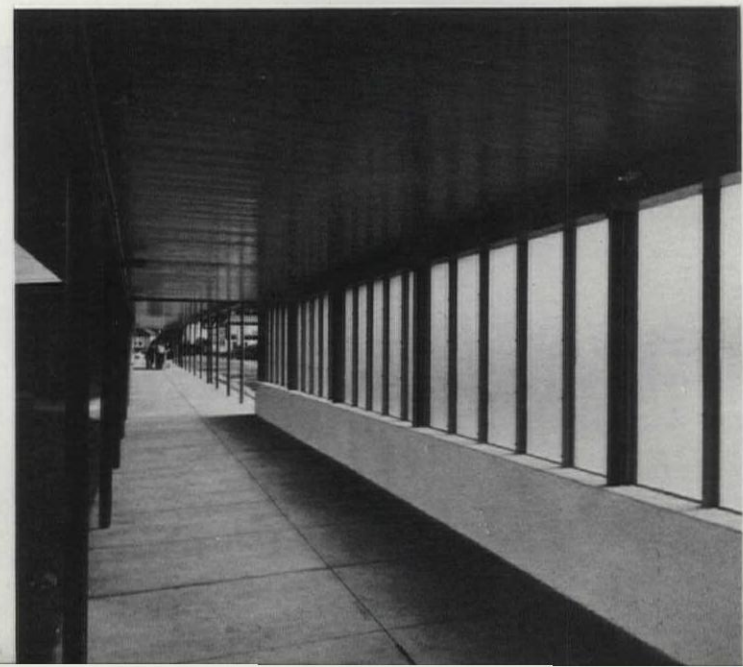
The problem at the Capuchino High School was not to design a complete new school but to add important components to an already established campus. Illustrated here are five of these—the Little Theater/Arts & Crafts Building; Gymnasium; Shop Building; Library/Administration Building; and new Classroom Building. A new 1000-seat Auditorium is currently under construction.

The 30-acre site is an irregular trapezoid, with a drop of 80 feet from the highest to the lowest point. In placement and design of the new components, the major axes of the existing buildings were continued and emphasized. The new Shop Building occurs adjacent to the existing shops for operating efficiency, as well as keeping these relatively noisy units in comparative isolation from the academic units.

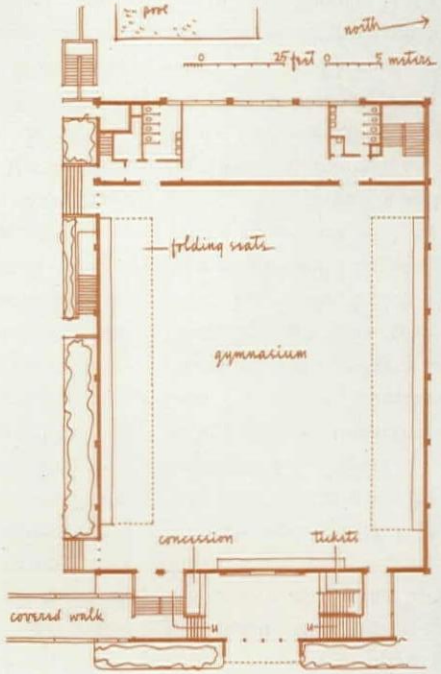
Modular concrete construction and exposed steel structural members were adopted to effect design harmony, as well as achieve required economies. Deducting cost of exterior utilities, paving, landscaping, and modifications to existing buildings, cost of new units came to $15.10 per square foot.

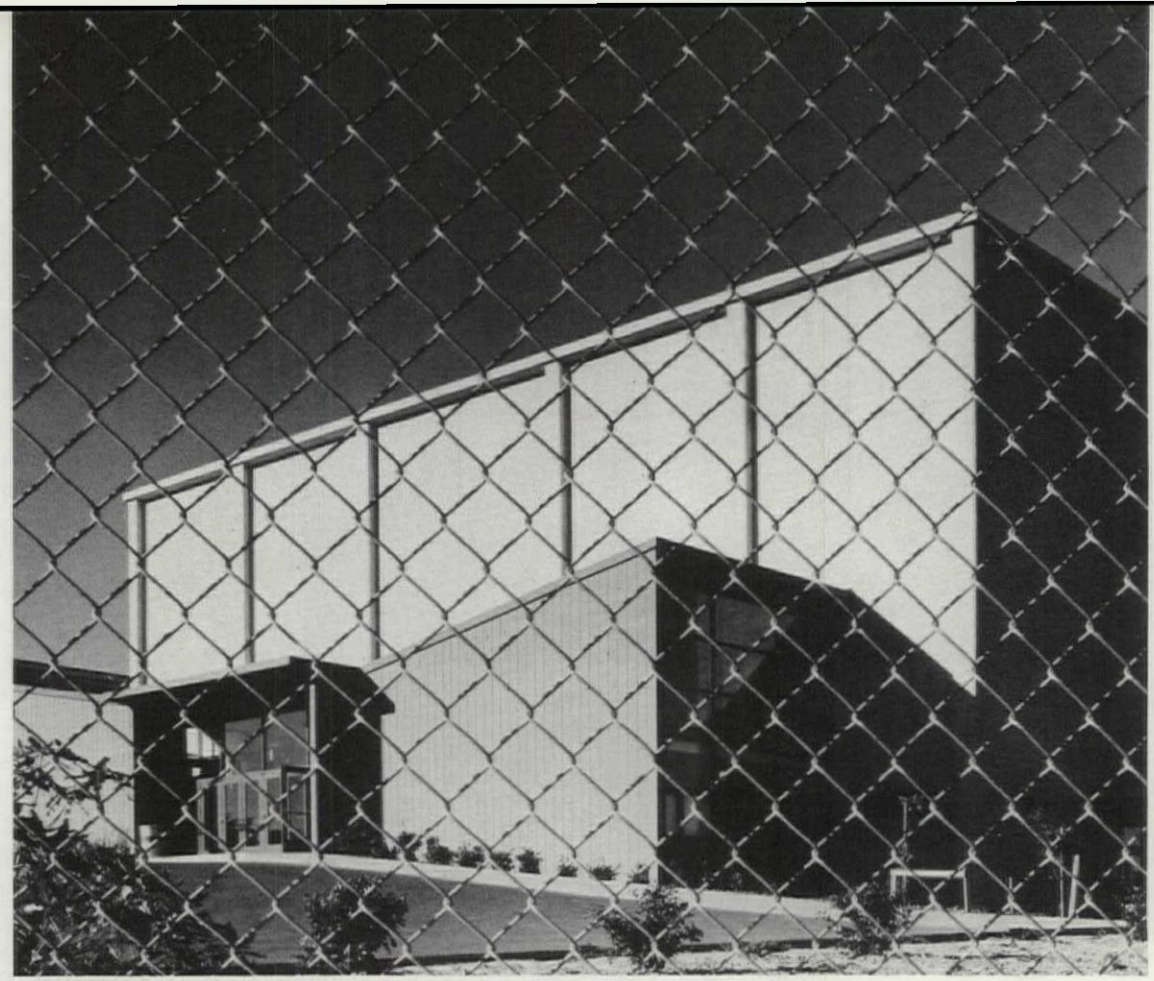
In December 1954 P/A, we presented a PROGRESS PREVIEW of the swimming pool designed for Capuchino — a system with sliding roof sections that allow full openness or, during sometimes heavy winds, enclosure. This design was tested in a wind tunnel, using a ⅛-in. scale model. The pool itself has been built; the arched steel-framed enclosure is yet to be installed.

The Architects wish very special credit given to the members of the School Board for their assistance and to Thomas Reynolds, Superintendent of Schools. Hall, Pregnoff & Mathew were Structural Engineers; G. M. Richards, Mechanical Engineer; Woodward, Clyde & Associates, Civil Engineers; Thomas D. Church, Landscape Architect; and Williams & Burrows, Inc., General Contractor.



high school: San Bruno, California

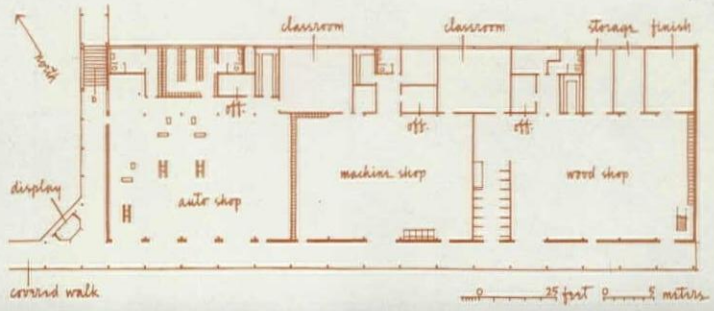


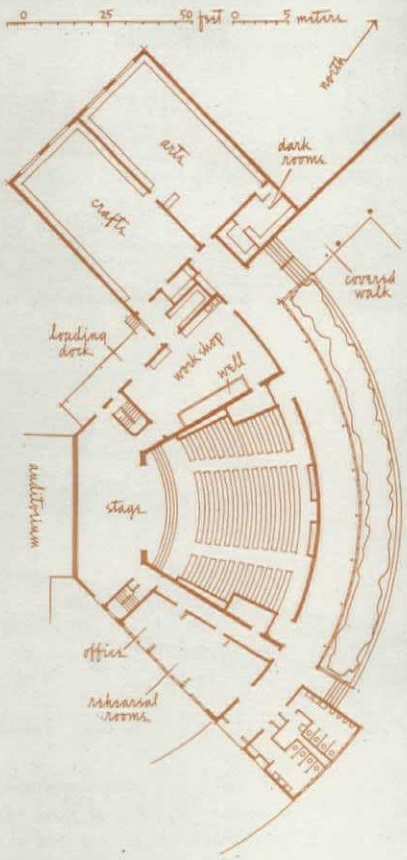




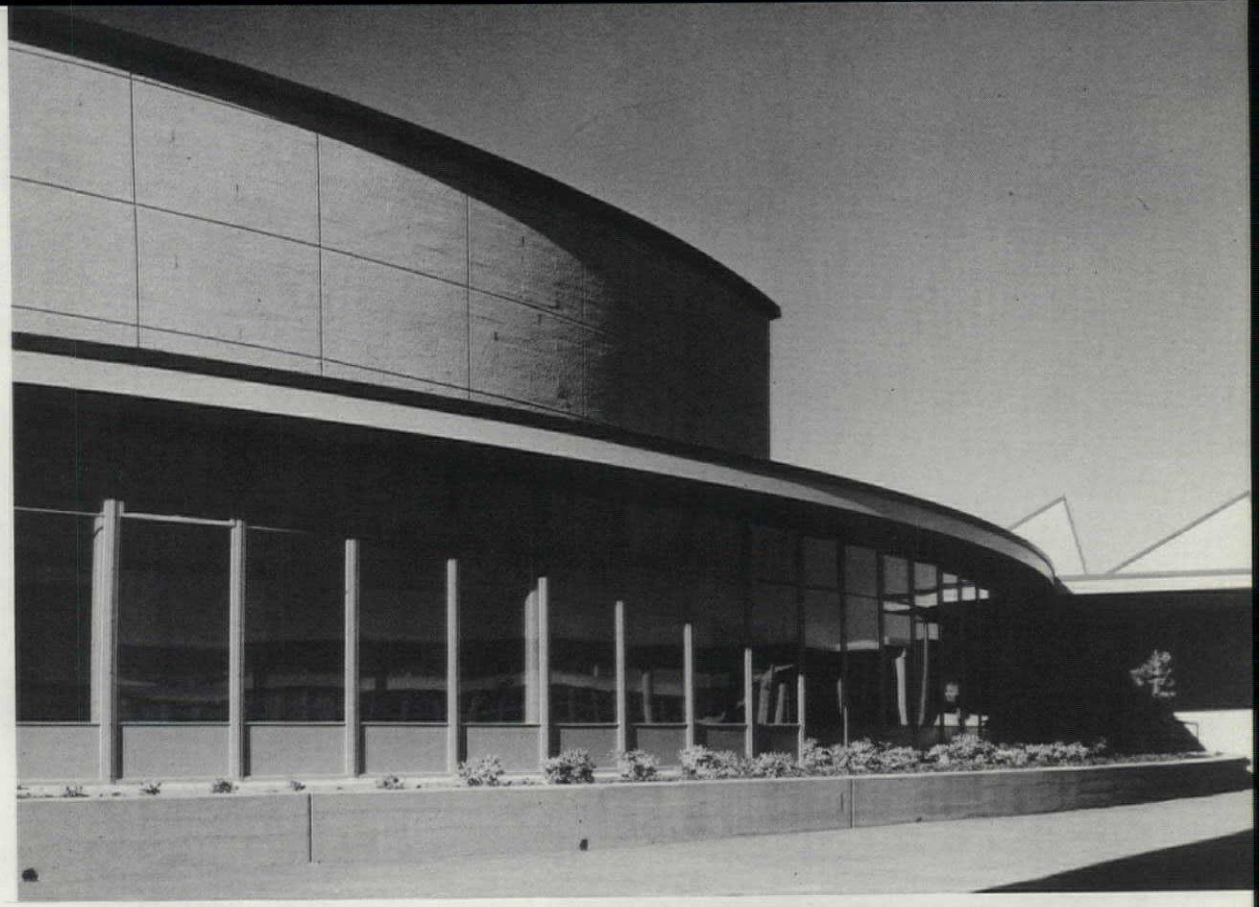
The boys' Gymnasium (above) *occurs at the north end of the campus, with a central entrance at an intermediate level and stairs up to the main gym floor and down to locker rooms and service areas; the new pool adjoins.*

The new Shop Building (left) *is organized in a long rectangle and placed parallel to a smaller, existing shop unit.* **Photos: Rondal Partridge**





The curve of the Little Theater echoes the seating line within; the glazed corridor leads back to the arts and crafts wing, where the rooms are lighted from sawtooth skylights (below), *and will later connect at the other end to the Auditorium, which is now being built.*





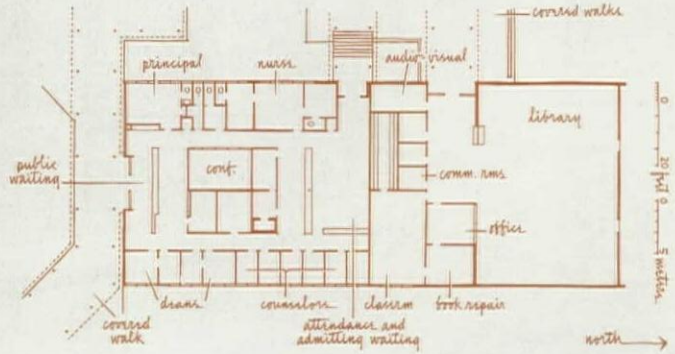


high school: San Bruno, California

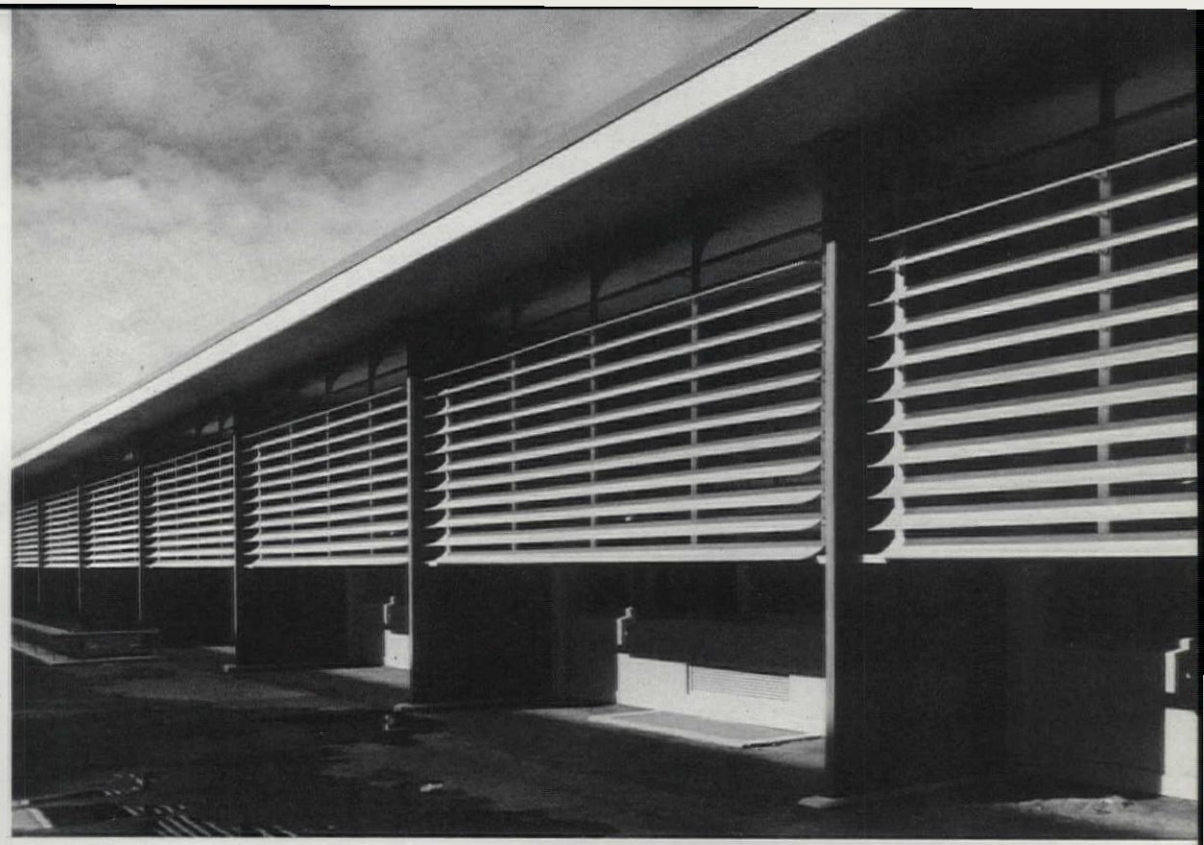


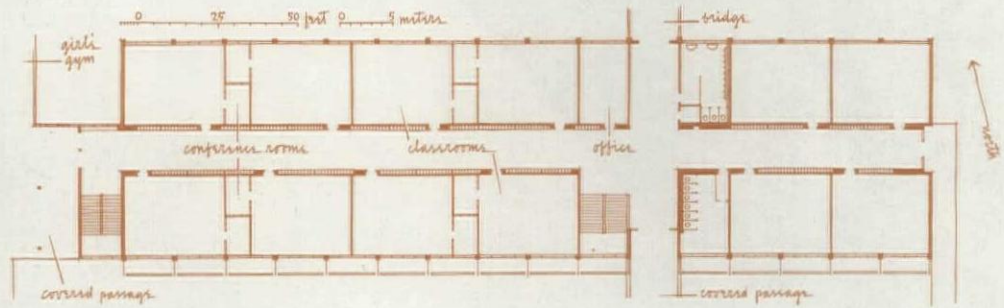
Administrative offices and library are combined in this centrally placed new building; steel roof girders swoop up in the reading room to tall, north-facing windows.







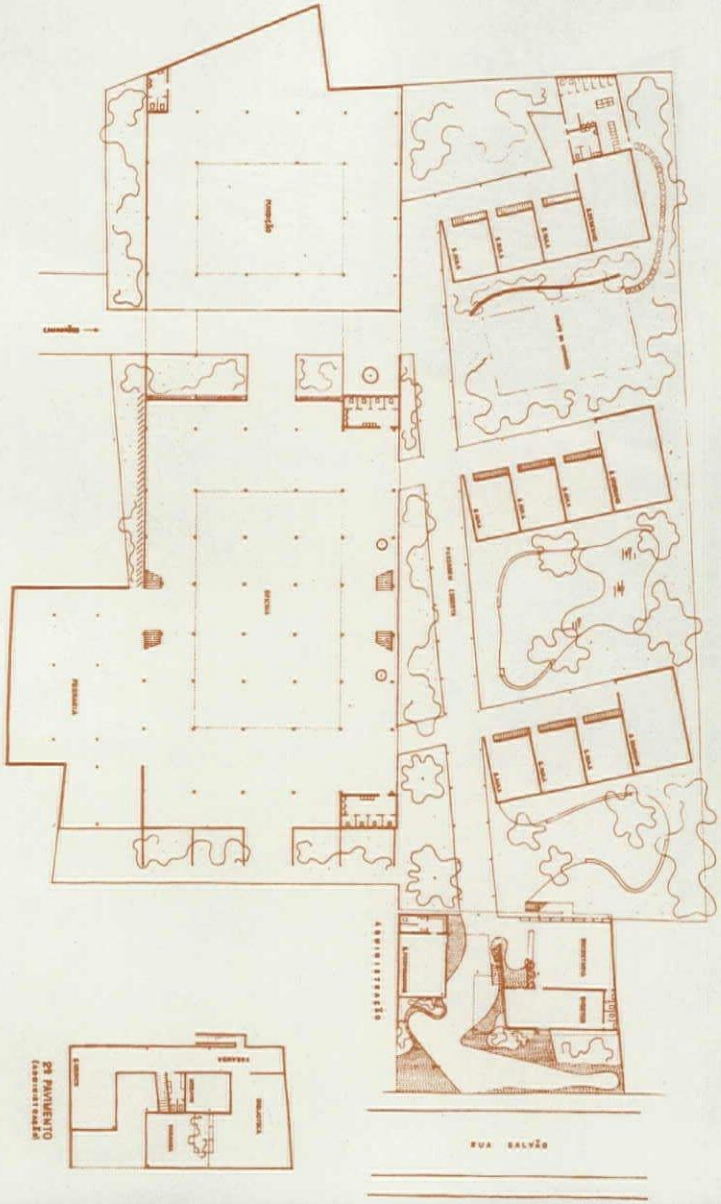




The new Classroom Building occurs at a point where grade change is abrupt. A portion of the lower level (used for storage) is wholly underground, while classrooms along the rear wall at this level, as well as faculty lounge and offices at the southeast corner, are above grade. Along the south wall, windows are protected by sun louvers installed 4'-6" outside the building envelope.

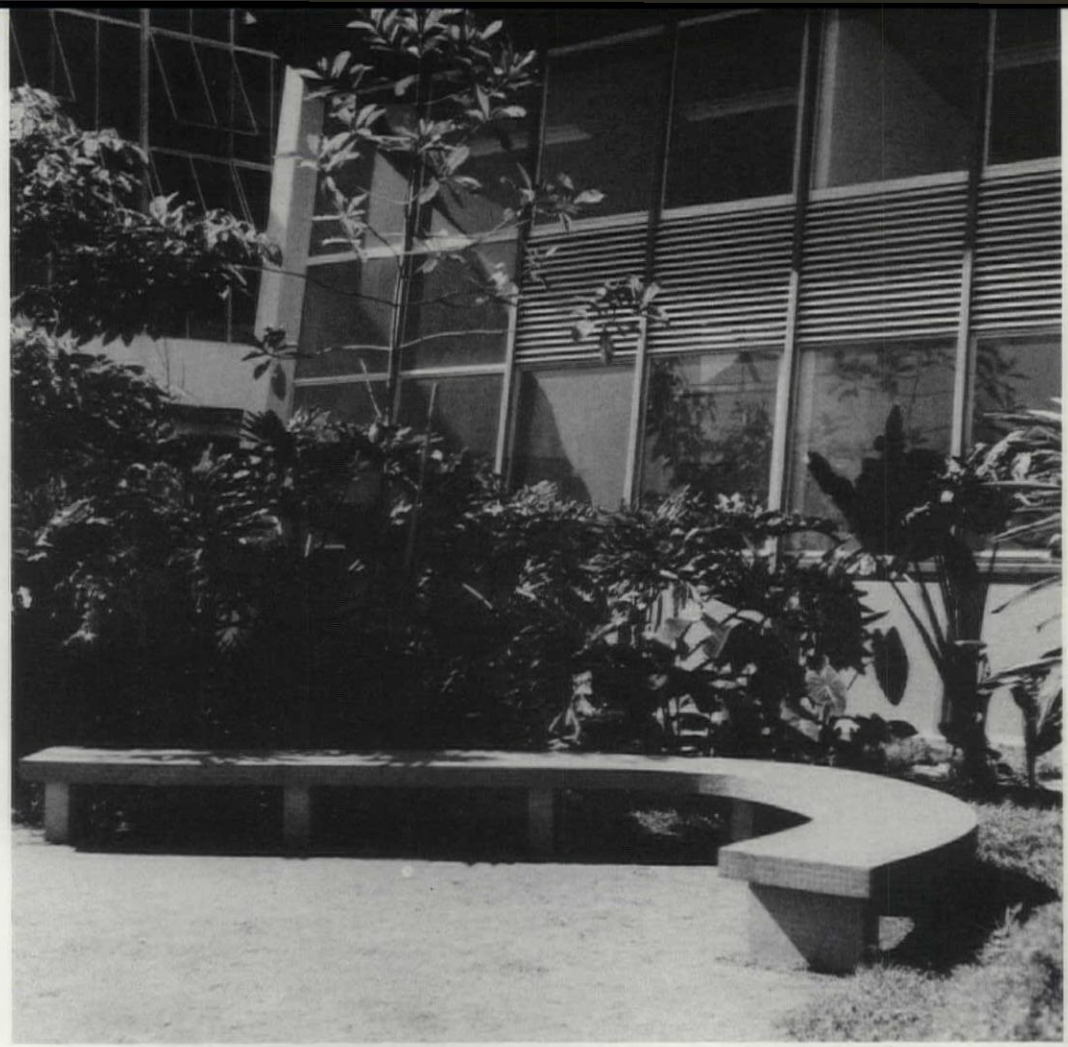
high school: Rio de Janeiro, Brazil

M. M. M. Roberto, Architects



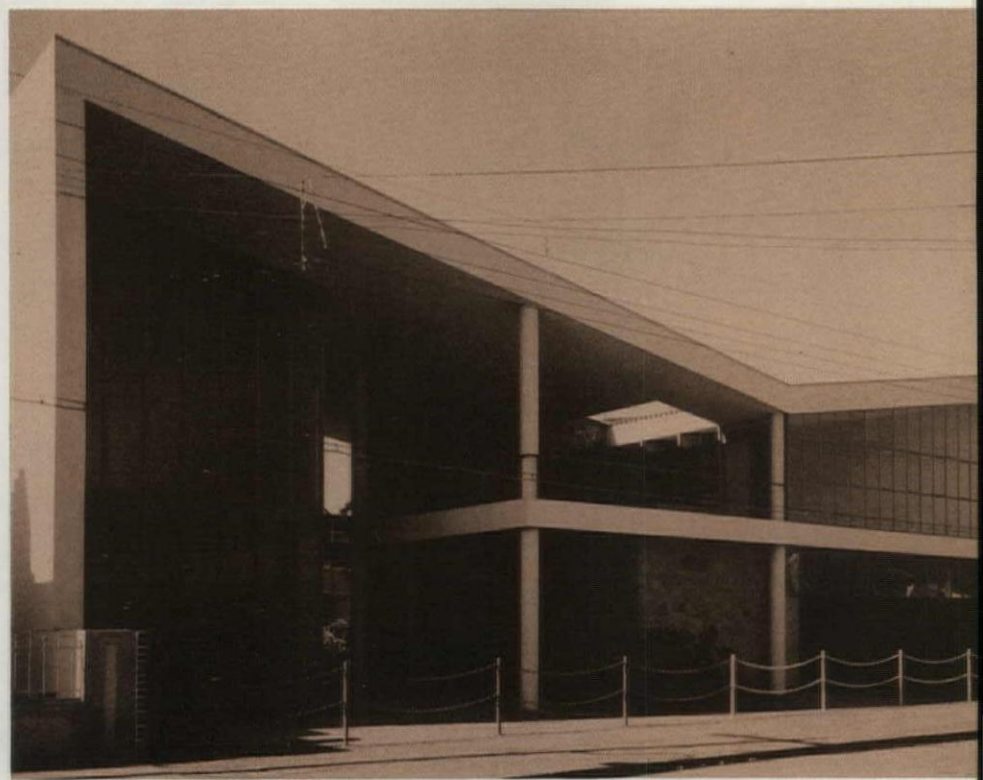


The uncompromising form of the old airplane hangar is softened by luxuriant landscaping and the graceful lines of the covered walkways. Photos: Marcel Gautherot



Classroom buildings (left) *are separated by landscaped areas.*

The two-story structure at the street front of the site contains administrative offices and faculty room on the ground floor; veranda, library, and medical department, upstairs.



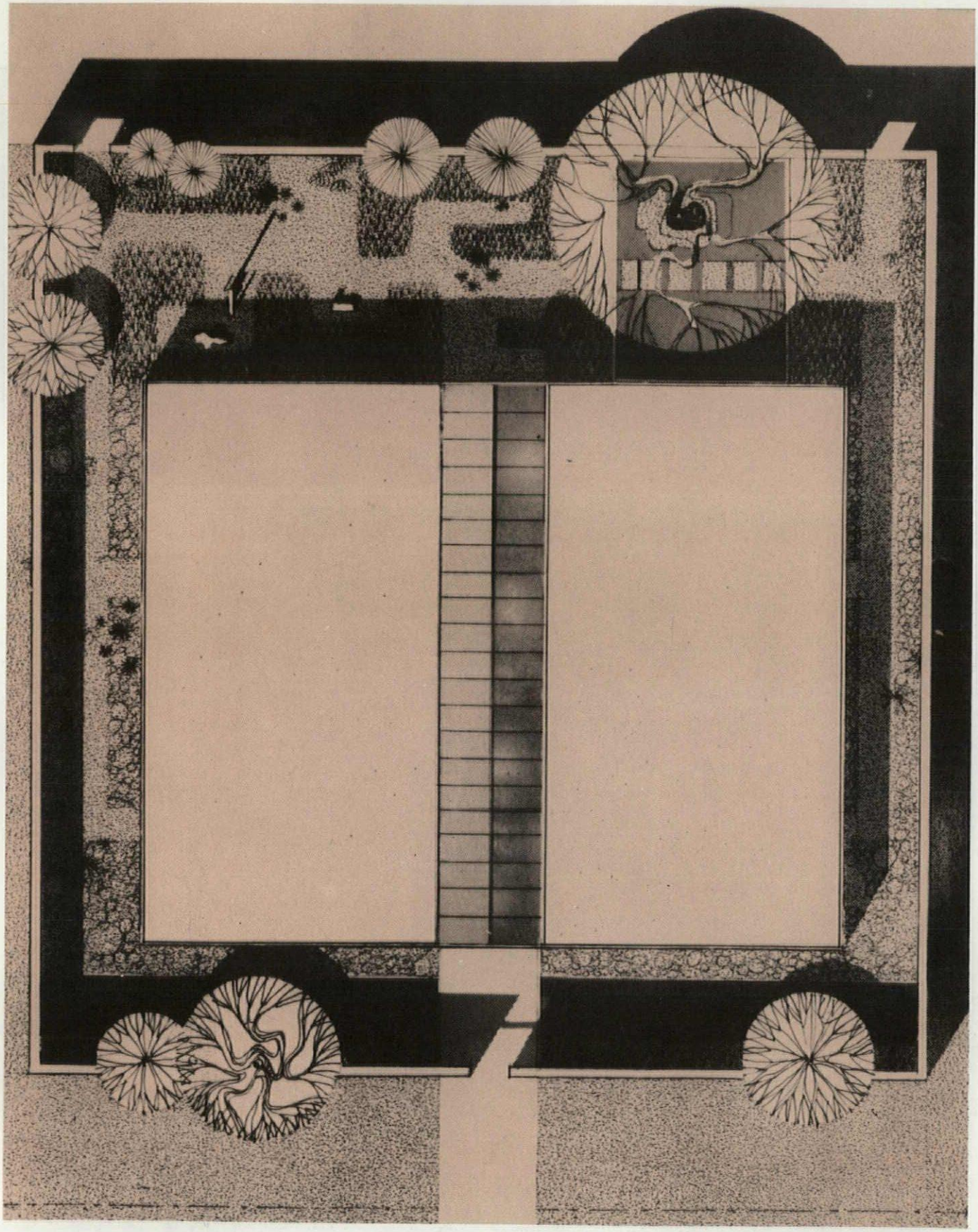


Design of this trade school was complicated by an exceptionally irregular site and the fact that the size and shape of the shop building—a wartime airplane hangar that had been imported from England—was predetermined.

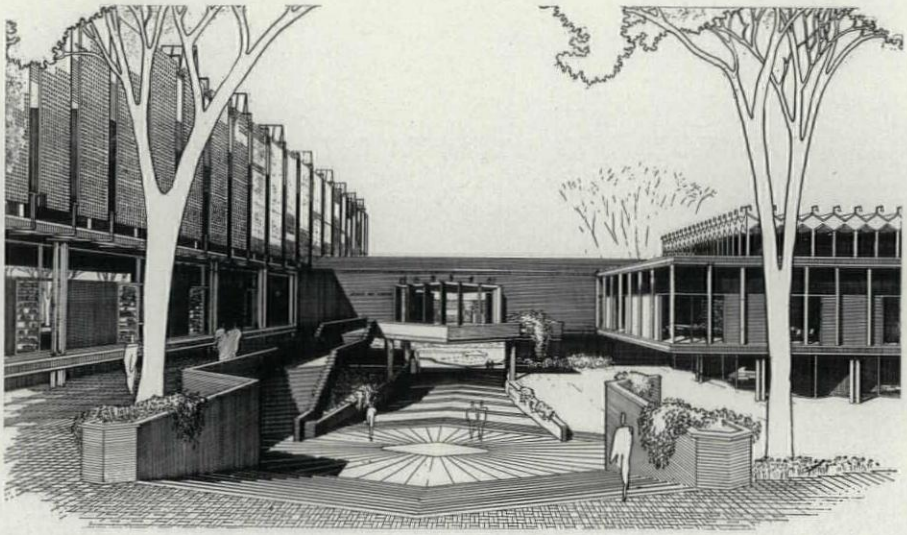
The solution was to place this large unit on the long dimension at one side of the site, organize the classrooms in three separate units on the opposite side of the plot, and place the main entrance, administrative offices, library, and health unit in a two-story structure on the relatively confined area at the street front. Two exterior stairways lead up to a veranda, the library, and health department.

Covered walks join all elements of the scheme, and the classroom buildings are placed at an angle to take full advantage of the prevailing breezes.

Concrete is the main structural material, though local stone and brick are used for certain wall areas. Rich landscaping typical of the area serves to co-ordinate the design.



buildings for advanced study

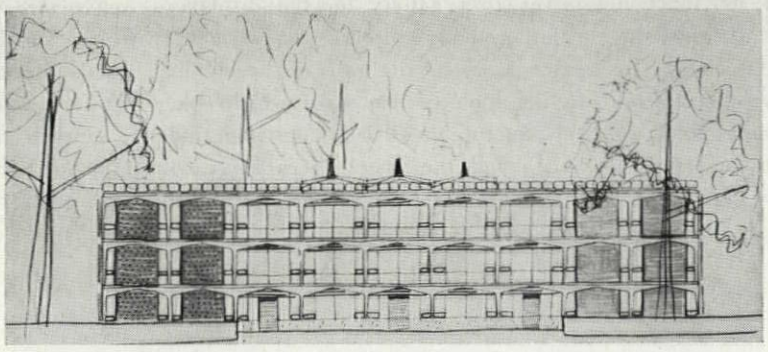


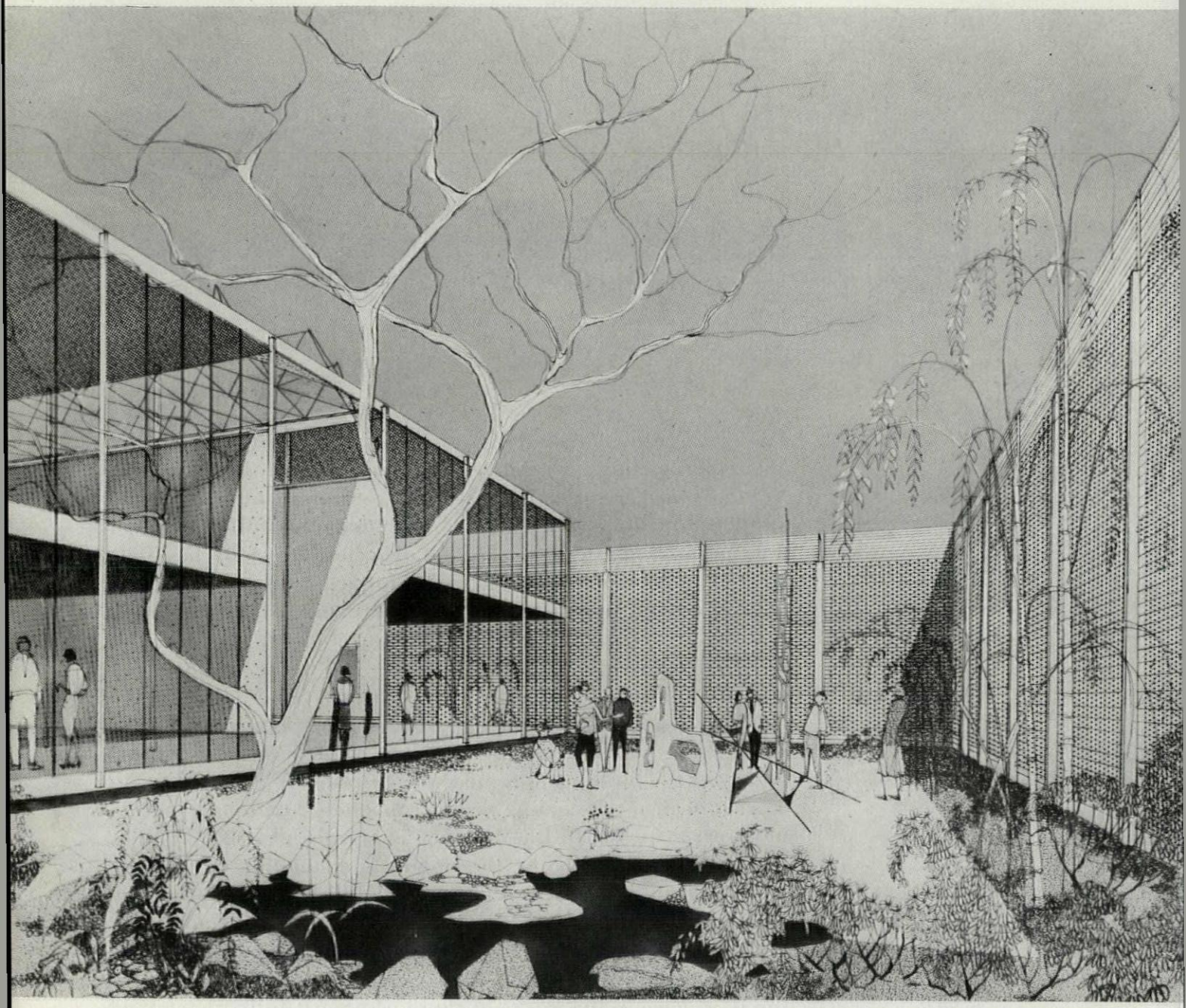
View into courtyard of the proposed Art Center for Wellesley College, Mass. (above). ***Paul Rudolph, Architect; Anderson, Beckwith & Haible, Associated Architects; Goldberg & Le Messurier, Structural Engineers; Stressinger, Adams, Maguire & Reidy, Mechanical Engineers; Sasaki & Novak, Landscape Architects.***

Though architecture is always in a state of flux, we are at present experiencing a transitional period of particular interest. Not any more are all buildings the uncompromising expression of their functional purpose, a lesson so successfully taught in the Twenties and Thirties. Le Corbusier, himself, has now broken away from his rigid rules toward a more sculptural expression and embellishment of the structure. It is interesting that the projects which seem to us to symbolize best this trend in *advanced* architectural thinking, are buildings for *advanced* education. Directions within this new trend are here illustrated: continuation of an historical architectural period, introduction of a new symmetry, use of structure as a decorative means, design of the building as a piece of sculpture. We stand to gain a great deal in the coming years from these attempts to create new forms, provided the designer comprehends that this new architecture demands the thorough understanding of the two- and three-dimensional arts. One shudders to think what confusion this new trend will bring when the new "emotional" architecture is practiced by the inexperienced and insensitive. Architecture is in essence a highly disciplined art form, reaching its apogee in the works of those who most fully understand and most successfully control design and structure. The new trend is full of pitfalls for those without a firm grasp of the essentials of liberation and some restraint on their emotions. It is encouraging to see, within this thesis, work as well understood and executed as that which follows.

School for the Society of Arts and Crafts, Detroit, Mich. (left and pages 146-147). ***Yamasaki, Leinweber & Associates, Architects.***

Study for the north elevation of the new Engineering Laboratory Building for Washington University, St. Louis, Mo. (below). ***Fitch & Nicholas, Architects; Joseph Passoneau, Consulting Architect; William K. Y. Tao, Mechanical Engineer; Boyd & Petry, Structural Engineers.***



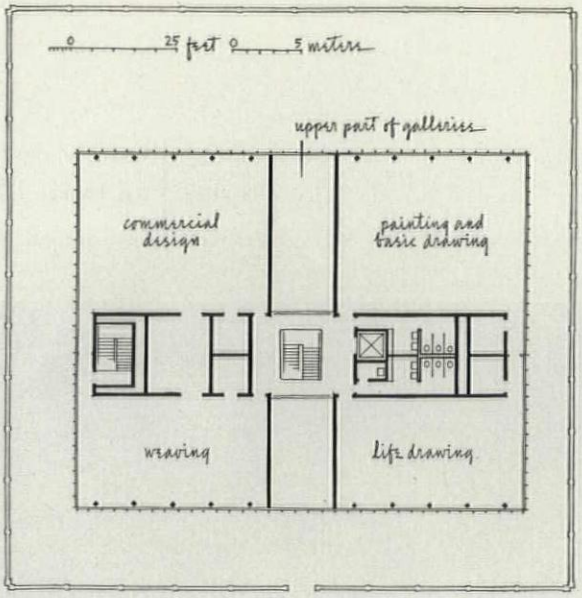


arts and crafts school

Exemplifying this new trend toward a more inventive and rich architecture, design no longer controlled by function alone, is this art school designed by Yamasaki, Leinweber & Associates. In this case, the architects have almost arbitrarily fitted the teaching areas into two rectangular building blocks and linked the two with an impressive hall—a design concept which recurs in a number of recent projects from this architectural firm. Here, the brilliantly daylighted hall serves as a gallery for the display of paintings and sculpture. The symmetry extends beyond the walls of the building to the high garden walls which shield the structure on all four sides from traffic noises and the disturbances caused by a midtown neighborhood presently in the process of redevelopment. Parking spaces will be provided outside the garden walls. Landscaping of the gardens (*see plan on page 144*) has been designed to give ever-changing views from the building's interior. The architects envision the use of water and areas of gravel and planting in the front garden (*above*); thick planting on one side, delicate on the other; and open spaces with gravel, rocks, and trees at the rear.

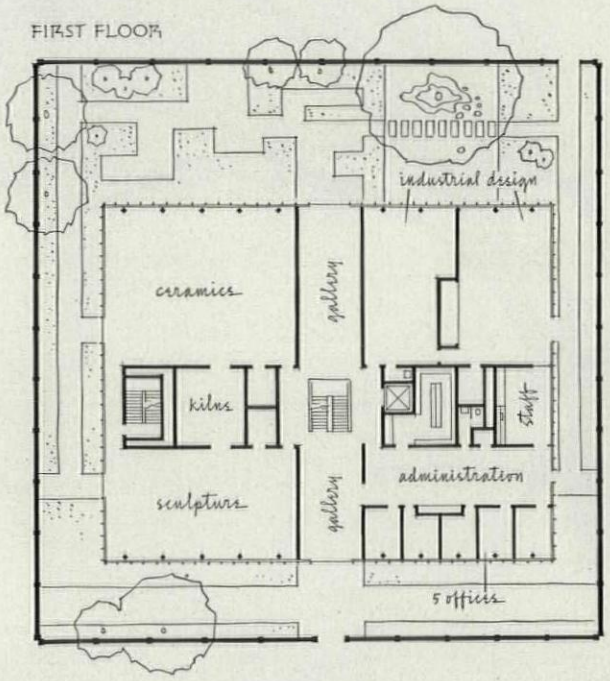
location | Detroit, Michigan

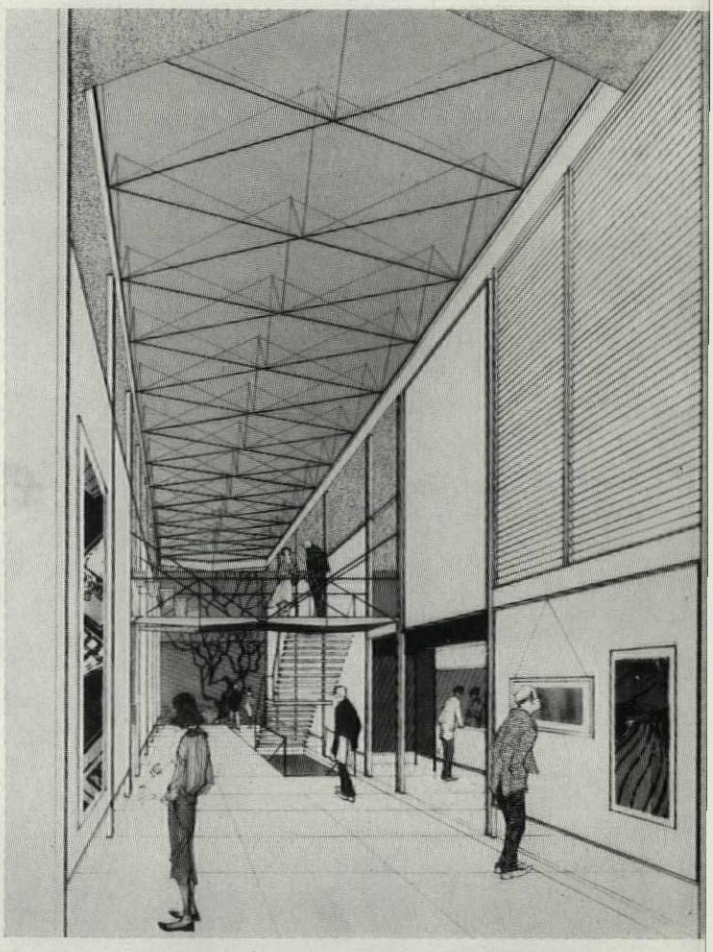
architects | Yamasaki, Leinweber & Associates

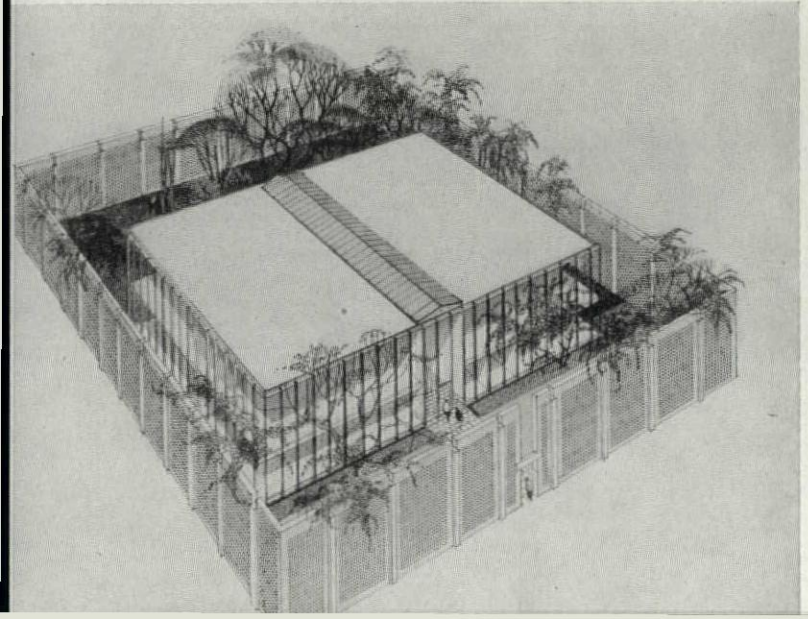


SECOND FLOOR

FIRST FLOOR





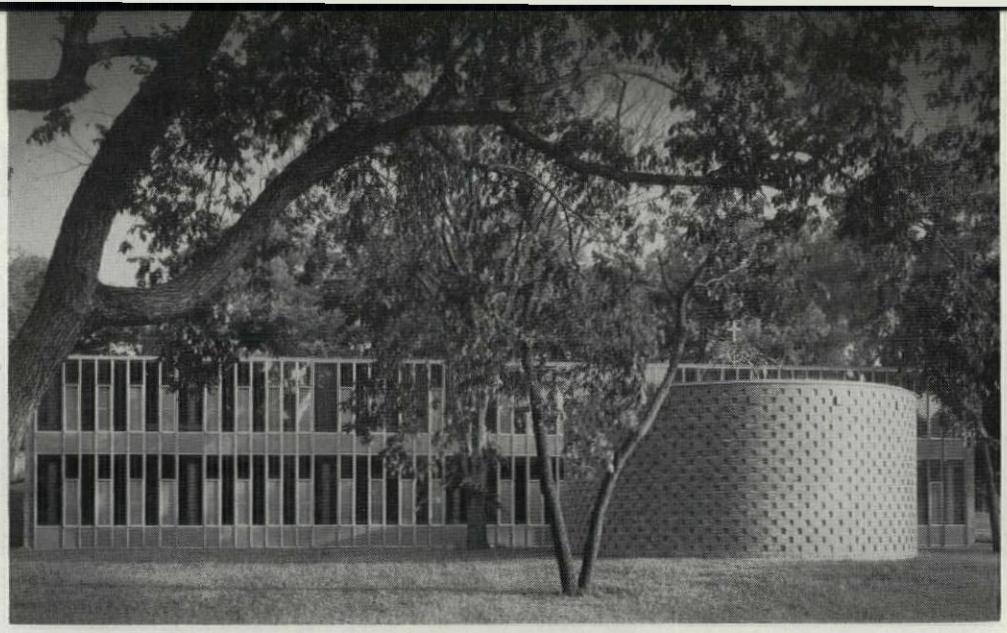


Entrance to the school will be through a full-height opening in the high garden wall. For control of the opening, the architects propose metal gates, possibly of bronze. A stone lintel will bear the name of the school. Through the gates the tall central gallery (above) *will be clearly visible. An auditorium, additional exhibit area, lockers, library, and mechanical spaces will be located in the basement.*

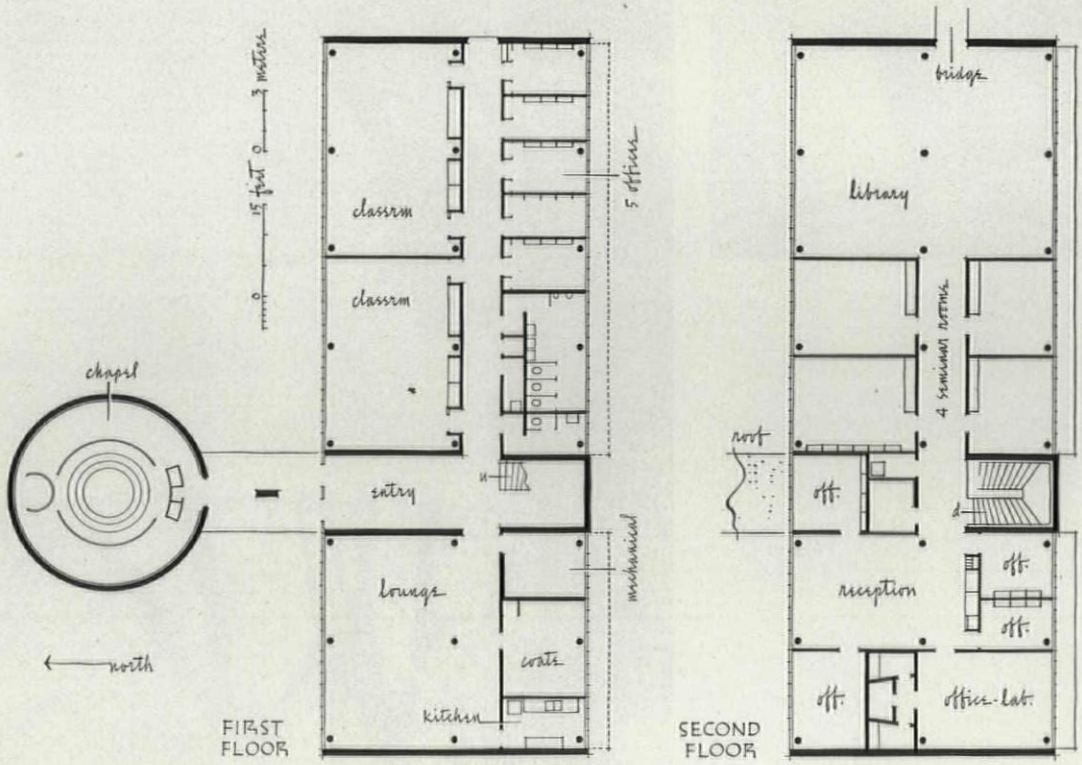
theological school and chapel

client	Drake University
location	Des Moines, Iowa
architects	Eero Saarinen & Associates

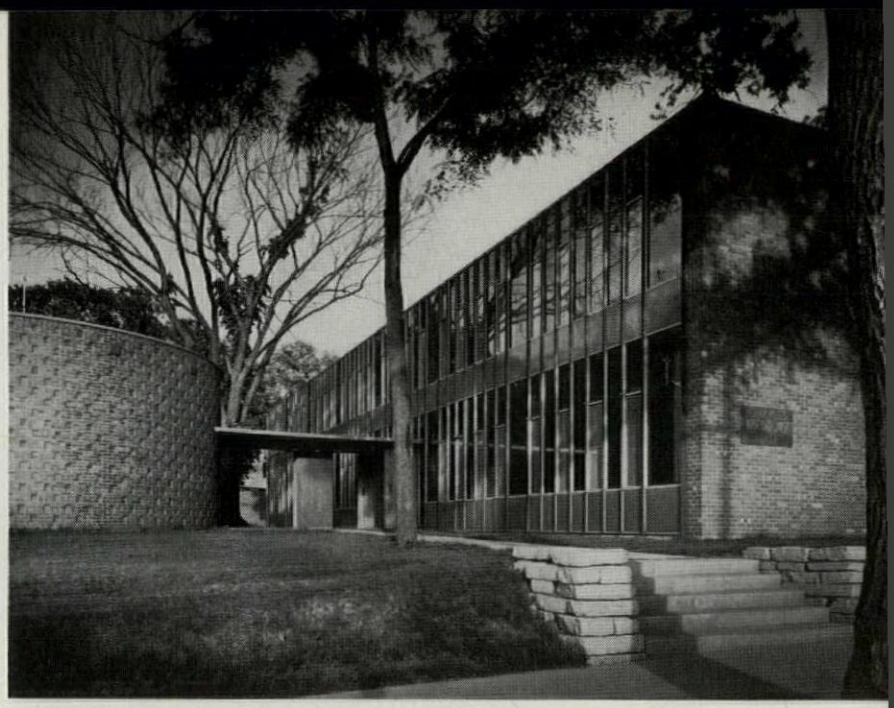


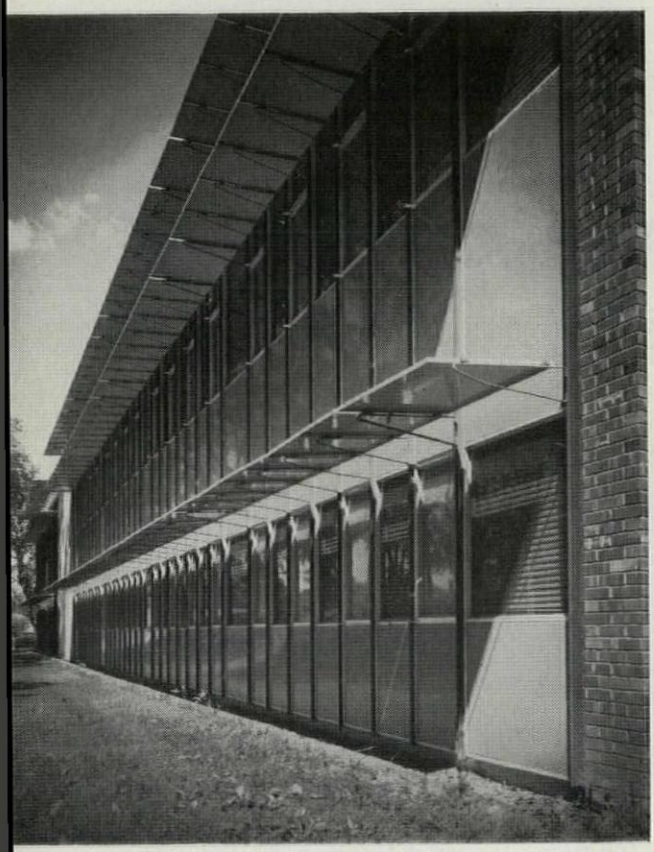


Another stage in the evolving Drake University Campus has been completed with construction of the Divinity School and a small Chapel for meditation. "We created a small court," writes Saarinen, "with the south wall of the Pharmacy Building (*November 1950 P/A*), the retaining wall on the east (upon which will be built a future larger chapel), and the School of Divinity itself on the south. In the future, this court will be more clearly defined . . . it may, for instance, have an iron fence dividing it from the general campus area, thus creating a slightly more secluded outdoor space. . . . It seemed appropriate to have the little meditation chamber stand in the court, the way the baptistries of Italy stand in squares." Its bold circular form and distinctive brick pattern set the Chapel apart from the other brick buildings on the campus, and also are in pleasing contrast with the aluminum grid of the divinity school window wall. Structurally, a brick cavity wall supports the wood trusses of the little Chapel (*see* SELECTED DETAIL). At the Divinity School, reinforced-concrete slabs are supported on concrete beams and columns. Solid end walls are of brick, cavity construction, and curtain walls use insulated porcelain metal panels (*see* SELECTED DETAIL). Paul S. Calkins was Structural Engineer; Hyde & Bobbio, Mechanical Engineers; Fane F. Vawter & Co., General Contractor.



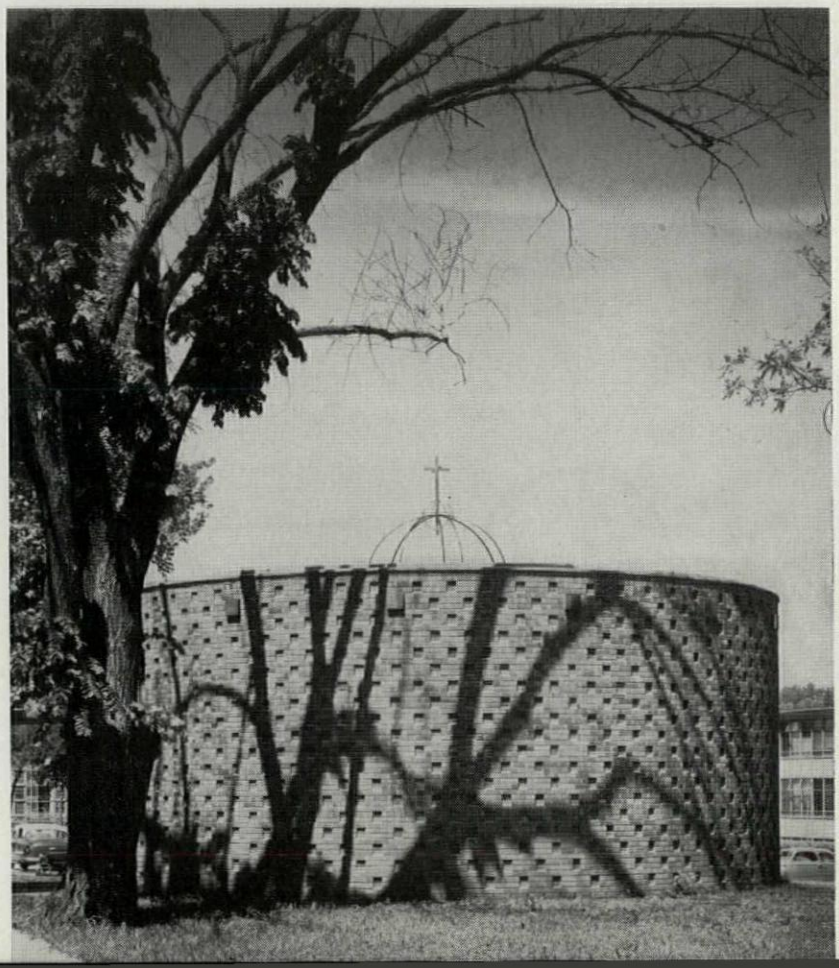
theological school and chapel

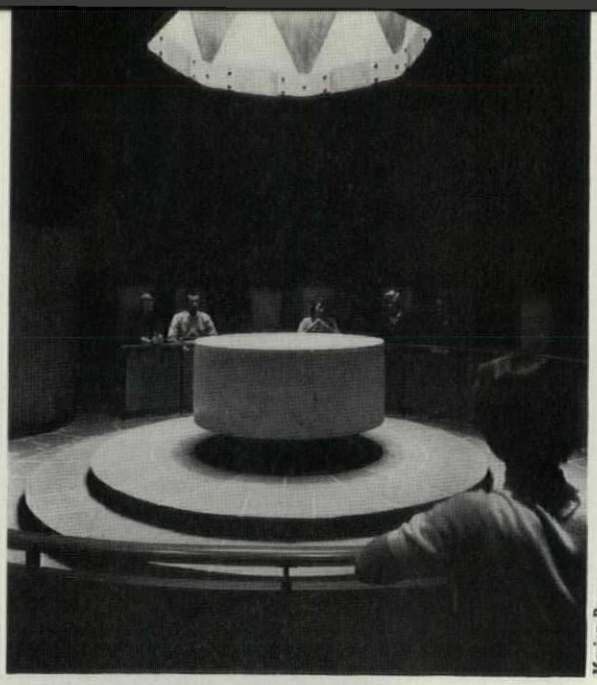




It was the architects' wish to reduce the Divinity School to a much smaller scale than the adjoining Pharmacy Building. "Consequently," writes Saarinen, "there are very narrow windows set in bays so that the structure of the building can be more clearly felt." On the south side (left), *projecting louvers and shade from existing trees protect offices and seminar rooms from direct sun.*

Photos (except as noted) : Warren Reynolds, Infinity Inc.





Marion Pease

Light, both natural and artificial, is directed toward the central ceremonial table. Natural light enters through a plastic dome; artificial lights are mounted directly under the dome. A baffle of wood cuts glare and direct vision into the light source. Seats surrounding the ceremonial table are purposely unlighted to keep emphasis on altar and distraction to a minimum. Dark-stained vertical oak slats line the interior of the Chapel. The floor is of slate.



theological school and chapel

Materials & Methods

construction

Foundation: reinforced concrete: cement—Hawkeye Portland Cement Company; reinforcing steel—Joseph T. Ryerson & Sons, Inc. **Structure:** frame, floors, and roof: reinforced concrete. **Walls & wall surfacing:** brick-cavity end walls; insulated porcelain-enamel panels and sunshades—Wolverine Porcelain Enameling Company; structural tee-mullions for panel support—C. W. Olson Manufacturing Company; rest rooms, toilets: structural glazed tile—Natco Corporation. **Floor Surfacing:** asphalt tile—B. F. Goodrich Company; ceramic tile; slate—Roberts Slate Company. **Ceiling surfacing:** plaster; cement-bonded wood-fiber panels—Insulrock Corporation. **Roof surfacing:** built-up roofing; joint filler — Celotex Corporation. **Waterproofing & dampproofing:** copper-fabric flashing—Wasco Products, Inc.; waterproofing—A. C. Horn Company. **Insulation:** glass-fiber—Owens-Corning Fiberglas Corporation. **Drainage:** roof drains—Josam Manufacturing Company; galvanized-steel pipe—Youngstown Sheet & Tube Company. **Partitions:** gypsum block & plaster; metal—Henry Weis Manufacturing Company, Inc. **Windows:** aluminum: fixed and casement—Michael Flynn Manufacturing Company; glass—Libby-Owens-Ford Glass Company; obscure glass—Blue Ridge Glass Corporation; plastic skydomes—Wasco Products, Inc. **Doors:** solid-core wood interior doors—Curtis Companies, Inc.; oak veneer, solid-core wood entrance doors, millwork—Geo. P. Smith Company; glazed, aluminum exit door—Kawneer Company. **Hardware:** lock sets, hinges—Yale & Towne Manufacturing Company; concealed door closers—Oscar C. Rixson Company; casement window operators—The Stanley Works, H. S. Getty & Company; panic exits and floor closers—Kawneer Company. **Paint:** Iowa Paint Company.

equipment

Specialized equipment: steel kitchen equipment—St. Charles Manufacturing Company; intercom: buzzers—Edwards Company, Inc. **Lighting fixtures:** fluorescent fixtures—Century Lighting, Neo Ray Products, Inc.; downlights—Litecraft Manufacturing Corporation; blackboard lighting—Gotham Lighting Corporation. **Electrical Distribution:** service entrance switch, panelboards, and multibreakers—Kinney Electrical Manufacturing Company, Inc.; cable—General Cable Corporation; wiring devices—National Electric Products Corporation; wall switches and receptacles—Bryant Electric Company. **Plumbing & Sanitary:** water closets and lavatories—American Radiator & Standard Sanitary Corporation; toilet seats—C. F. Church Manufacturing Company; electric water heater—Pennsylvania Range Boiler Company; drinking fountains—Crane Company; flush valves—Sloan Valve Company; water-supply system: sump pump—Weil Pump Company; valves — Lunkenheimer Company; wrought-iron pipe—A. M. Byers Company; steel pipe—Youngstown Sheet & Tube Company; cast-iron pipe—Central Foundry Company; copper-pipe—Chase Brass & Copper Company, Inc. **Heating:** forced hot-water; fuel: gas and oil; unit entrance heaters and convectors—The Trane Company; finned-tube radiators—Kritzer Radiant Coils, Inc.; galvanized-iron ducts; air operating controls—Johnson Service Company; circulating pumps—Bell & Gosset Company; underground conduit—Ric-Wil, Inc.; air-handling unit—Kennard Corporation; hot-water coils—Buffalo Forge Company.

Divinity School library

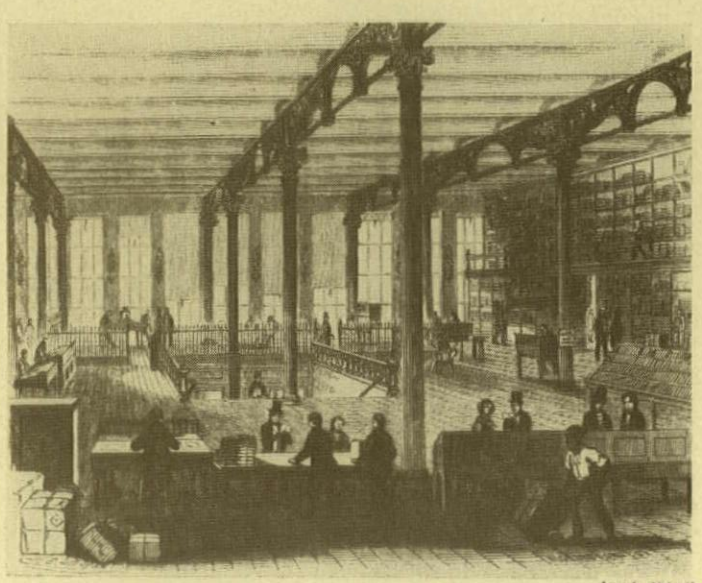


PROGRESSIVE ARCHITECTURE IN AMERICA

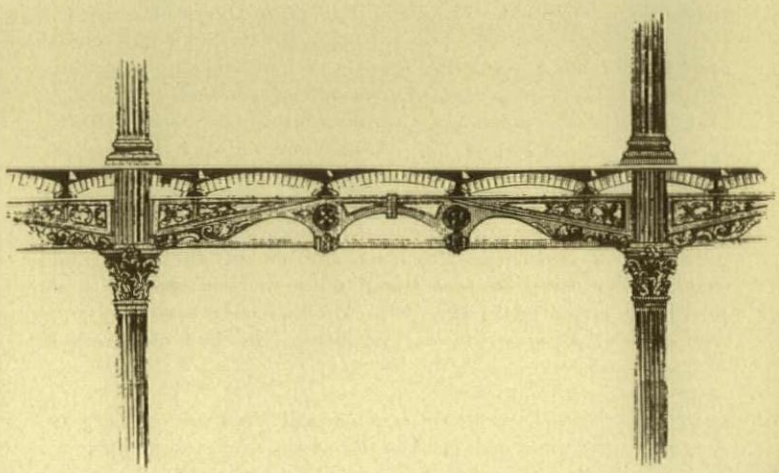
HARPER & BROTHERS BUILDING—1854
New York, New York
John B. Corlies, Architect-Builder
James Bogardus, Engineer

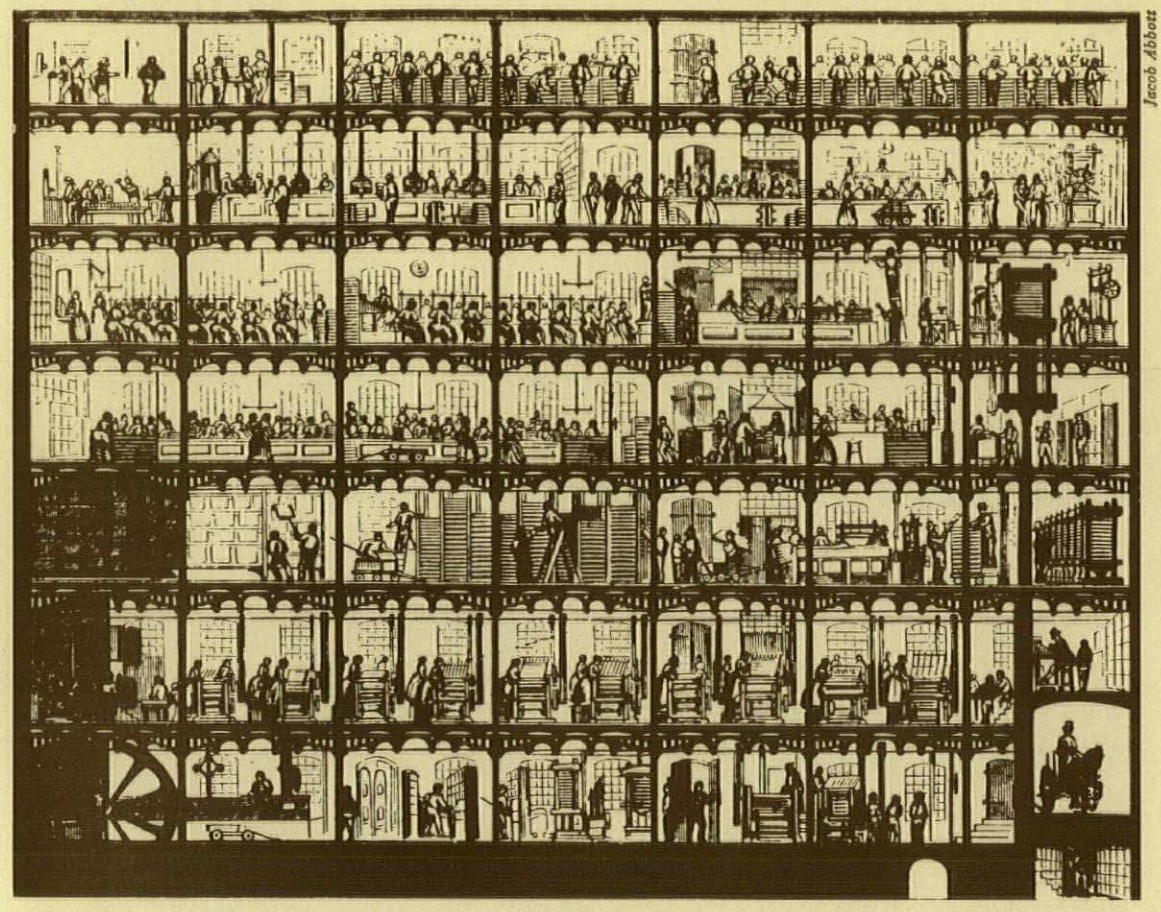


Brown Brothers

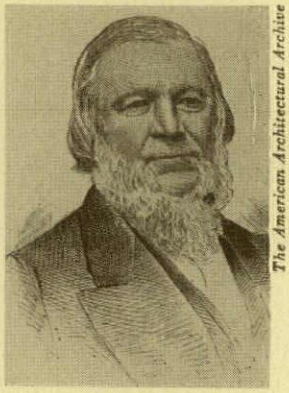


Jacob Abbott





Jacob Abbott



The American Architectural Archive

James Bogardus

Although the dream of the tall building is both ancient and international, a considerable part of its evolution is an American story. The development of the metal skeleton, which together with the elevator and modern fireproofing have made the skyscraper a reality, goes back several centuries for its origins in England and on the Continent, as well as in the United States. Cast-iron columns were used in England in the 18th Century and were not unknown in American mills and factories before 1850. A cast-iron framing system for mill interiors, developed in 1801 by the Englishmen, Boulton and Watt, was further refined in the '30s and '40s by William Fairbairn, who effectively substituted more flexible wrought-iron members for cast-iron ceiling beams. In this country, James Bogardus was perhaps the most noteworthy of the pioneers of skeleton construction.

The Harper & Brothers Building, erected in 1854 after a disastrous million-dollar fire had burned out the publishers' plant the previous December, used Bogardus' system of cast- and wrought-iron framing and cast-iron façade in one of the most progressive buildings of its day. In its concern with fireproofing and metal construction it was an important and influential design with serious implications for the future. As Turpin C. Bannister has pointed out, the architect associated with Bogardus—John B. Corlies—did a remarkable job of applying all of the possible precautions against fire in a co-ordinated program of protection: the use of incombustible materials, the elimination of vertical shaftways, the separation of the manufacturing processes from the selling, editorial, and storage functions by the use of two buildings with a courtyard between. Only the eventual enclosure of the metal structural members by masonry fireproofing was missing. Bogardus' design of the cast- and wrought-iron supports was based on a method that he had previously patented in the '40s. By fastening together iron wall panels, piers, columns, and beams, he had achieved—in theory and in a factory built at Center and Duane Streets in 1848-49—a complete metal frame where the exterior iron structure supported the floors and thus made the startling advance of eliminating the traditional masonry bearing wall. Harpers' building did not go this far, since it used both masonry and cast-iron façades, as well as brick interior walls. Inside the building, cast-iron columns supported exposed cast- and wrought-iron girders, across which were placed partly concealed wrought-iron ceiling beams, similar to I-beams. Brick arches were constructed between these beams and leveled with cement to a flat surface, on which was laid a pine-plank floor. The visible "bow-string" girders, a departure from previous practice, were similar to a truss, combining a wrought-iron tie-rod with an elaborate, arched cast-iron body. This design helped to counteract the lateral stresses of each individual member, making for more self-sustaining interior framing and decreasing ultimate wall loads. The success and practicality of the system were dependent upon the use of wrought iron for the ceiling beams above the girders, although until this date no beams of a suitable size had been produced in the United States. In 1854, flanged wrought-iron beams were rolled in Pittsburgh and Trenton, New Jersey, with Peter Cooper's mills in Trenton generally credited with the first ones, intended for Cooper's "Scientific Institution" in New York. These beams were diverted by Government request to the U. S. Assay Building on Wall Street and to the Harpers building in 1854, before any were employed in Cooper Union building in 1855.

The design of the Harpers' building was functional in the best 20th Century esthetic sense. Structure was frankly in the open, as in the columns and girders; or clearly indicated, as in the ridge lines where brick ceiling arches spring from the beams. Even the use of cast decoration on the girders had its structural purpose; it was not irrelevant Victorian camouflage, but served to make the material heaviest at the greatest points of stress. The rigidity of the iron façade permitted the use of large areas of glass, and a repetition of identical patterns of glass and cast iron—not without similarity to the simplified, equally mechanical rhythms of glass-and-metal architecture today. ADA LOUISE HUXTABLE

Grateful acknowledgement for material and assistance is made to Turpin C. Bannister and to Alan Burnham, whose monograph on James Bogardus is in preparation.

high-temperature hot-water design

by Tyler G. Hicks*

High-temperature hot-water (HTHW) heating systems are fairly extensively used in several European countries for space heating, central heating, and process heating. For these installations it proves more economical than a high- or low-pressure steam-heating system. During the last 20 years in this country, there has been a steady increase in interest in HTHW for heating buildings of all types, for a variety of process operations, and snow and ice melting.

U. S. Air Force

Perhaps the outstanding space-heating installations using HTHW in the U.S. today are those found at a number of our Air Force bases, as well as at the new Air Force Academy, Colorado Springs, Colorado. At the Academy, buildings are widely separated and some of the pipe-runs from the central-heating plant are two miles long!

Besides its U.S. bases, the Air Force has bases throughout the world. Since 1952, HTHW heating has been the only system installed in new bases at home and abroad when the heating load exceeded about 35,000 lb of steam per hr.

importance of system

The growing interest in and the possible economies of HTHW heating make this system of interest and importance to all architects today. While the advantages are well known, and will not be detailed here,[1] the engineering procedures and general rules used in the design of these systems are not too well known. These other factors are discussed in this article.

where used

HTHW heating systems are used in a variety of applications. These include school buildings, hospitals, industrial plants, public buildings, dormitories, housing projects, airports, shopping centers, apartment houses, and a variety of other projects.

While it is difficult and risky to formulate a general rule, engineers generally consider a HTHW system whenever the heat load of a project is in the range of five to 10 million Btu per hr. In this range, most engineers believe it is worthwhile to make an economic study of the relative cost of a HTHW system, compared with a standard steam system. Another rule followed by many design engineers is to recommend the use of HTHW when the peak load of a new system exceeds 10 million Btu per hr and the space-heating load is 40 to 50 percent of the total peak load.

While these two rules are not to be taken as final and fixed, they indicate present thinking in the design field with regard to HTHW systems. As more experience is gained, it may be that HTHW will be used in installations having peak loads under five million Btu per hr. But it will probably be some time before enough experience is gained to determine whether this is advisable.

types of systems

Two general types of HTHW systems are being installed—new systems and conversion systems. At present, new systems account for about 20 percent of the installations, while conversions run 80 percent.

New HTHW systems using a variety of components such as piping, boilers, pumps, controls, valves, and fittings are designed for a specific project on a given site. Each system must be specially designed for the conditions existing in the installation. There are no packaged HTHW systems available for extensive projects. Since each system must be individually designed, the designer has an opportunity to exercise his imagination on every new project.

Conversion systems generally use existing steam piping to supply and return HTHW to the loads requiring it. Thus, a large investment in piping need not be made. In general, conversion from steam to HTHW is made only when there is a process need for HTHW. It is usually difficult to justify a conversion on the basis of space heating alone.

It is always necessary to make an economic study of an existing plant before starting to convert from a steam system to a HTHW system. The reason is that the conversion process, while economical from the piping standpoint, may be uneconomical from the aspect of the boilers or hot-water generators that are used. The only way these facts can be verified is by means of an economic study.

pressures, temperatures

Water pressure used in a HTHW system depends on the temperature required in the project, the length of the pipe-runs, the types of pumps used, and a number of other factors. For long pipe-runs (one mile or more) the water temperature chosen is usually about 400F. When the runs are shorter, lower temperatures can be used—normally in the 300F range. Higher temperatures are required for longer runs, because there is the possibility of greater heat loss from the piping, with a resulting decrease in the water temperature. With proper design and insulation, the temperature loss seldom exceeds 3F per mile of pipe. An allowance of 10 percent for heat loss in the piping is often made in design calculations, but the actual loss seldom exceeds five percent.

The water pressure corresponding to a temperature of 400F is approximately 247 psia, while that at 220F is 17 psia.

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* *Associate Editor* Power *Magazine.*

[1] *"Central Heating with High-Temperature Hot-Water," by William O'Reilly, March 1954 P/A; "Mechanical Engineering Critique," by William J. McGuinness, October 1955 P/A.*

Pressure equal to at least either value must be maintained in a system to prevent vaporization of the water. During vaporization the water changes to steam. The term high-temperature is usually applied only to systems operating above 250F. The term high-pressure is generally given to systems operating at pressures above 100 psi.

The pressure required in a HTHW system is usually developed by one or more centrifugal pumps (*Figure 1*). These are sized to deliver the desired quantity of hot water at a pressure that insures sufficient head to overcome the friction and static losses in the system. These factors are discussed in greater detail later in this article. Many HTHW systems in operation today use pressures and temperatures only slightly higher than the older, conventional, hot-water heating systems.

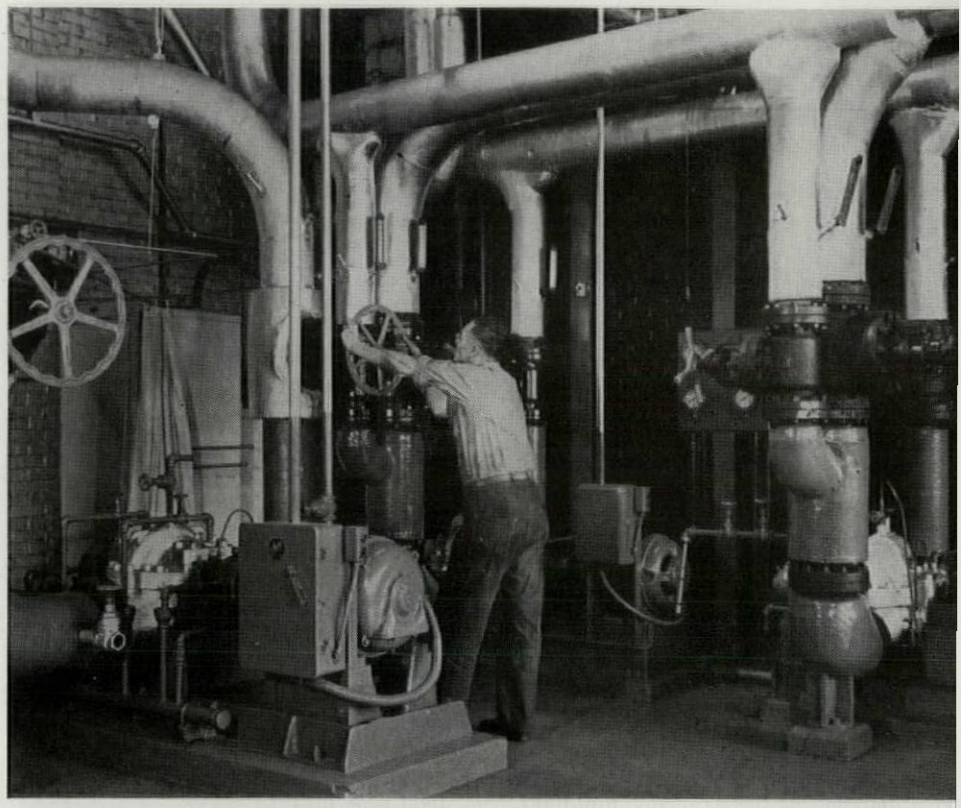


Figure 1—typical installation of centrifugal pumps for a HTHW *system. Operator is adjusting the blending control valve.*
Synthane Corp.

heat sources

Boilers are the most common source of heat for HTHW systems, but other types of heat exchangers also find use, particularly in converted systems.

Firetube boilers (*Figure 2*), are suitable for lower-capacity HTHW systems —those having a load up to 10-million Btu per hr. For best results, the boiler should incorporate any devices that will give it sustained high efficiencies. Since the water-storage capacity of most firetube boilers is usually relatively large, an expansion tank may be unnecessary.

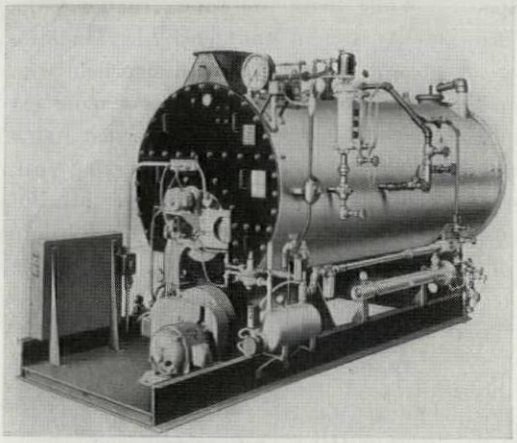


Figure 2—modern package-type firetube boiler suitable for smaller HTHW *systems.*
Cleaver-Brooks Co., Inc.

For heat loads exceeding about 10-million Btu per hr, watertube boilers are almost exclusively used in the U.S. today on new installations. Some conversion jobs of larger loads use firetube boilers, because they were originally installed for steam supply and are still serviceable.

Drumless radiant-type watertube boilers (*Figure 3*), with extensive water-wall tubing in the furnace are popular for HTHW systems having heat loads greater than 10-million Btu per hr. These boilers may be either natural- or forced-circulation units, depending on the design, heat-release rate in the furnace, and the system heat load. Forced-circulation boilers are provided with one or more special pumps to circulate water through the tubes. In some designs, usually those of

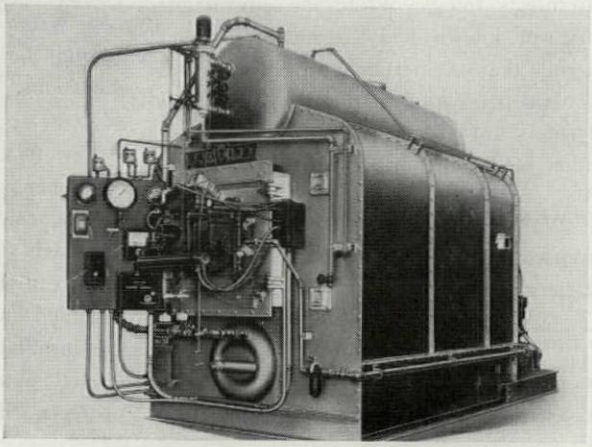


Figure 3—one type of watertube boiler suitable for use in HTHW *systems.*
Erie City Boiler Works

Figure 4—typical vertical-shell cascade-type heater for HTHW.

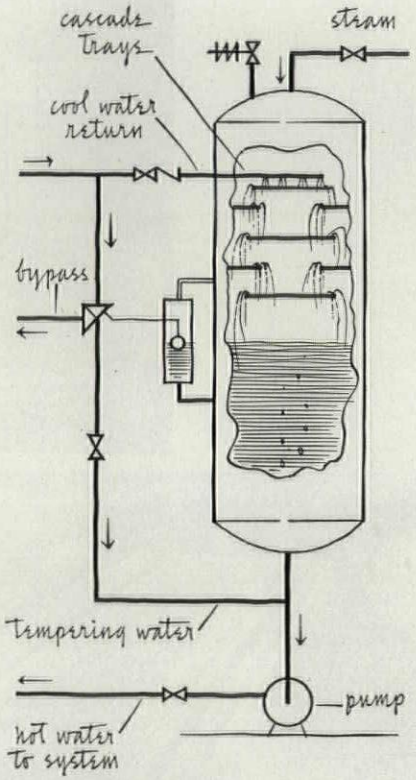
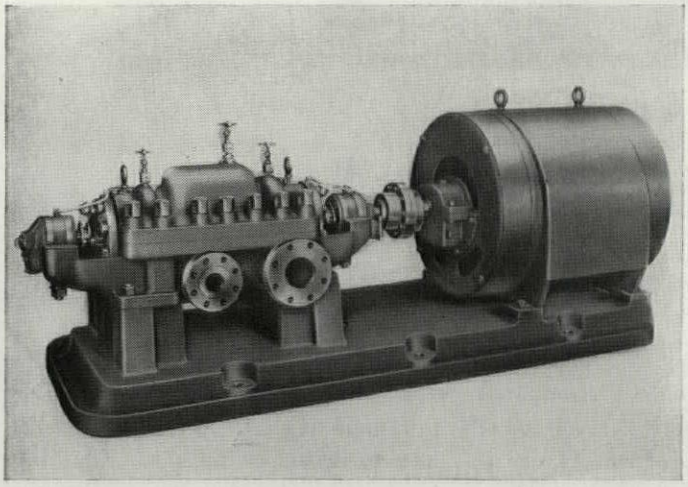


Figure 5—circulating pumps for HTHW *are usually fitted with watercooled stuffing boxes and ball bearings, as in this unit.*
Pennsylvania Pump and Compressor Co.



lower ratings, the system circulating pumps may be used to produce the circulation in the boiler, instead of special separate pumps.

heaters

Direct-contact steam heaters, either horizontal or vertical (*Figure 4*), may be used to generate HTHW instead of a boiler. In heaters of this type steam enters at the top and mixes with water cascading over trays in the heater shell. An auxiliary circulating pump may be used to provide the needed water movement in the heater, or the main pumps may be relied upon.

The direct-contact heater provides an easy means of converting a portion of a steam system to HTHW. Standard-design heaters for this service are available, but specially designed units are also used.

circulating pumps

These are invariably centrifugal units (*Figure 1*). Since the temperature of the water handled may exceed 400F, watercooled stuffing boxes and bearings are used (*Figure 5*). For best results, only pumps designed for HTHW service are recommended.

Two circulating pumps are generally suitable for systems having a constant, or nearly constant, heat load. Three pumps should be used in systems where the load varies considerably. Then one, two, or all three units can be operated, depending on the load. Connect the pumps so that they discharge to the system supply main. Then the pressure they develop will prevent flashing of the HTHW.

When choosing the capacity of circulating pumps, one must be sure to compute the flow based on the density and specific heat of the water at the temperature in the system. Most moderate-size systems use only one set of pumps to provide water circulation. In large systems with long runs, separate pumps for branch and return circuits may be installed. This permits use of lower-pressure pumps for the main circulating duties.

Cold water is often introduced into the suction of the circulation pump to prevent flashing of the liquid entering the pump. Flashing is likely to occur in the low-pressure area at the impeller suction. A perforated tube connected to the suction pipe is used to feed cold water into the stream of warm return water.

piping

Either above- or below-ground piping (*Figure 6*), may be used to distribute HTHW. The pipe size chosen depends on the allowable pressure loss, the temperature drop allowable between the pump discharge and boiler inlet, the liquid velocity, and the flow rate.

Usual water velocities chosen vary between one and five ft per sec. Pressure losses commonly allowed range between 1.0 and 1.5 psi per 100 ft of pipe. The temperature loss ordinarily varies between 75 and 150F, depending on system design, the pipe size, and the heat given to the system.

Two equal-size pipes are required for HTHW systems—one supply and one return line. Welded piping is preferred

because it produces a somewhat lower friction loss. Control valves in piping outside the boiler room and buildings served by the system should preferably have welding ends, while flanged valves are preferred for indoor use.

Pipe sizing is an important task in the design of HTHW systems because the size chosen directly affects the system's economics. While there are many variations from one system to another, present practice is to transmit from one-million to three-million Btu per hr per in. of pipe diameter. The lower value is usually met in 2- and 3-in. pipes, while the larger value is for pipes up to 6 in. in diameter. There may, however, be large variations in this rule.

Pressure loss in the piping system is usually computed on the basis of the longest run. This is often called the index circuit. Branch circuits generally have a lower pressure loss, even though they contain apparatus which causes a head loss.

pipe insulation

To keep the temperature loss to within the usual limits—about 3F per mile, or a five percent heat loss—insulation should be fitted to the exterior of overhead and underground piping. Correct insulating procedures using a good grade of suitable insulation are important because large quantities of heat can be lost from piping that is not properly covered.

For outdoor, overhead piping, insulation thickness usually varies between one in. and three in., depending on the temperature of the water and the diameter of the pipe. Underground piping is usually the factory-assembled insulated type which need only be welded and backfilled after installation in its trench.

pipe expansion

Since the water in a HTHW system is at a fairly high temperature, expansion of the piping is always a factor in system design. For example, 10,000 ft of steel pipe will expand 23 ft when conveying water at an average temperature of 400F.

Either expansion bends (*Figure 7*), or an expansion joint (*Figure 8*), may be used to absorb the pipe movement. Expansion bends may be buried underground or used above the ground. Most expansion joints require some means of access for routine inspection. In underground piping this can be provided by building or installing a concrete or metal chamber around the joint. Always provide a moderate excess of expansion capacity in bends and joints so that a higher send-out temperature can be used, if desired.



Figure 6—underground HTHW supply and return lines before backfilling. These serve a university heating plant. *American Hydrotherm Corp.*

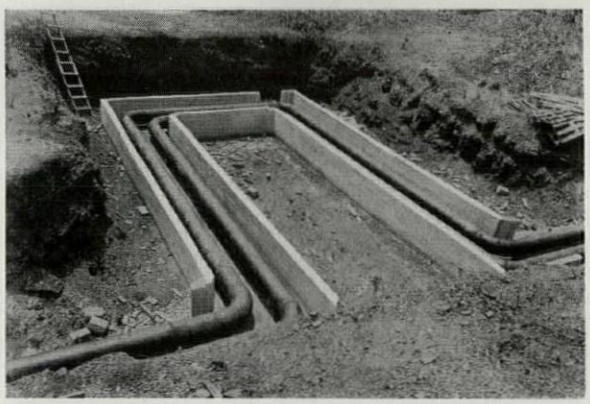


Figure 7—expansion bends in supply and return lines for a HTHW system. *American Hydrotherm Corp.*

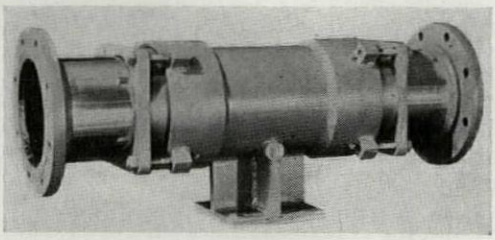


Figure 8—typical slip-type expansion joint for a piping system. *The Royalton Co., Inc.*

pipe fittings

These resemble the fittings used in low-temperature hot-water systems, with two exceptions: (1) air chambers, and (2) dirt traps. Air chambers are used at the highest points in the piping system to trap any air entrained in the water. They are usually made by welding a short cylinder to the top of the pipe. The cylinder is the same diameter as the pipe to which it is welded. Air is bled from the bottle by either an automatic or a manually operated valve.

Dirt traps are fitted to the low points of the piping system to collect any debris present in the water. They resemble air chambers, except that they are connected to the bottom of the pipe, instead of the top. A manually operated valve is used to drain any dirt present in the trap.

system controls

The main supply and return lines in a

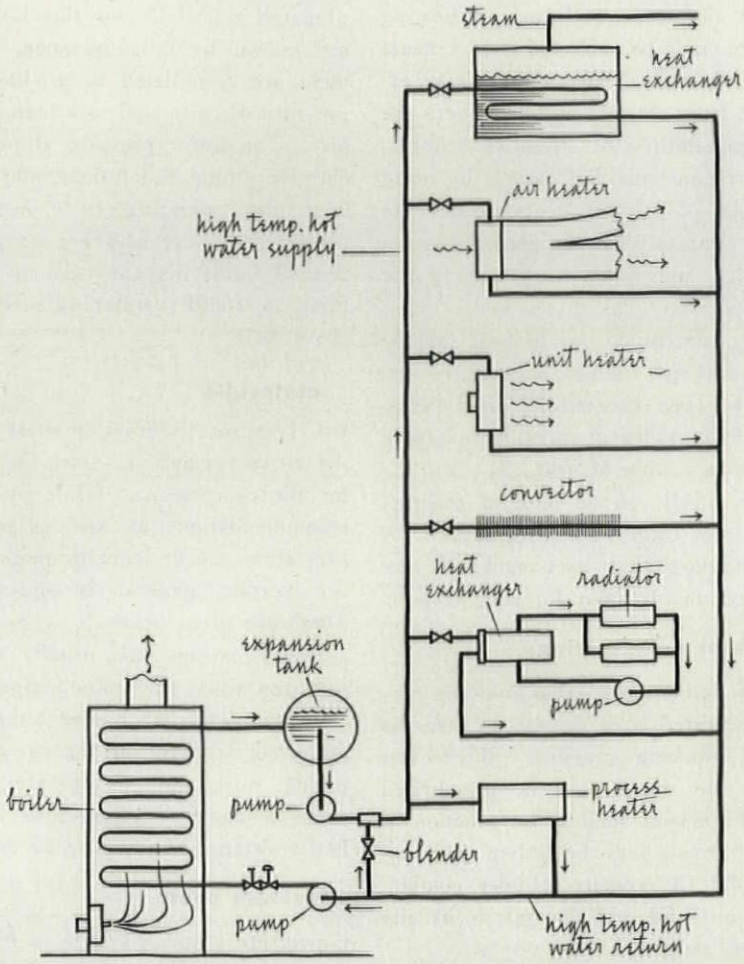


Figure 9—typical arrangement of an industrial HTHW *system.*

HTHW system usually require only a series of shutoff valves to permit isolating various parts of the system (*Figure 9*), for maintenance and repairs. Gate or globe valves may be used for shutoff service, depending on the preference of the designer and operating force. In general, gate valves seem somewhat more popular.

Two other important control centers are needed for the usual HTHW system: (1) boiler-room controls, and (2) load controls.

A typical boiler-valving arrangement is shown (*Figure 9*). As can be seen, control valves to regulate flow are needed at the boiler inlet and outlet and in the mixing or blending lines of the circulating pumps. These valves may be either manually or automatically operated, with the manual-type being somewhat more popular. Choose all valves carefully. Whether for shutoff or control service, they should have the minimum flow-resistance possible.

Cascade heaters (*Figure 4*), should be fitted with a float control to prevent flooding of the shell during operation. This can be a standard float-actuated valve suitable for the pressure and temperature in the system, or one of the popular mercury-switch-type float controls may be used.

Controls at the load points vary with the process served. The ultimate objective of most load controls is regulation of the temperature of the medium being heated by the HTHW. To accomplish this the heat exchanger may be fitted with a bypass or with flow regulating valves.

When a bypass is used, HTHW flowing toward the heat exchanger or other heat-transfer device is diverted from the supply to the return pipe *before* it enters the heat exchanger. The net result is to reduce the heat output of the heat exchanger during the period that HTHW is being bypassed. An automatic or manually controlled valve is used to control the flow of the bypassed HTHW.

Automatic valves for bypass control are actuated by the temperature or pressure of the medium being heated. The automatic valve may be air or electrically operated. Either throttling, modulating, or multiple-position-type valves can be used. The bypass may be piped around a single heat exchanger or group.

Flow-regulating valves can be used to control the flow through heat exchangers and other devices. Manually or automatically operated, they simply modulate flow, without bypassing any of the liquid. In general, bypass control of some type is preferred by most design engineers today.

Where all the load devices in a system are designed to take water at the same temperature, the heat output can be varied by altering the HTHW supply temperature. This is done either by mixing relatively cool return water with water leaving the boiler, or by reducing the boiler pressure. The last method is not too popular.

expansion tanks

Water expands when heated from a lower to a higher temperature. For example, when heated from 40 to 400F, one cu ft of water will expand about 16.5 percent. The expansion tank in a HTHW system is used to absorb some, but not all, of this percentage.

As shown (*Figure 9*), HTHW leaving the boiler enters the expansion tank, from where it flows to the suction of the system circulating pumps. The expansion tank also takes the place of the steam drum on the drumless watertube boilers.

During system operation the water level will rise and fall in the tank, depending on the demands of the system. The exact rise and fall is a function of the tank size, depth to which it is filled, and other factors. Also, the tank is usually located at an elevation above the HTHW piping and circulating pumps and acts to help pressurize the system. The usual water-level rise and fall chosen for the expansion tank varies between one and three ft.

Each expansion tank (two or more may be used in a large system) must be equipped with a certain minimum number of fittings. These are used to insure safety of both the liquid and vapor portions of the tank. The upper half of the expansion tank contains steam and must be fitted with relief or safety valves. A vent is also required, to permit filling the tank. The safety valves should conform to the ASME Code, or other local prevailing code.

The lower or water section of the tank should have a valved drain and one or more water-level indicators. For safety, these indicators may be fitted with alarms for the high- and low-level positions.

accumulators

These store HTHW during periods of low demand and supply it to the system during peak loads. In general, the use of accumulators is confined to larger, extensive systems where the amount of water being circulated is fairly large. In smaller systems, the expansion tank serves many of the functions of an accumulator.

The usual accumulator consists of a horizontal or vertical tank connected in the piping system in such a way that water can be pumped into and out of it, as desired. Some engineers feed a number of branch circuits from an accumulator, using a separate pump for each circuit or group of circuits. When a large accumulator is used, it helps to provide a constant load for the boilers because during periods of low heat demand the boilers can be operated to charge the accumulator.

heating HTHW

While boilers are probably the most common source of heat for HTHW, steam ranks a close second. Steam for heating the water may be extracted from a steam turbine, exhausted from a process, or exhausted from a steam turbine. There are many possibilities of attractive heat-balance arrangements and savings by using extraction or exhaust steam to generate HTHW. Thus, a plant can generate steam, electricity, and HTHW at extremely low costs.

Other sources of usable heat include refuse, garbage, rubbish, waste gases, etc. All have been successfully used, when available in sufficient quantity to give a continuous supply of heat.

HTHW itself can be used to generate steam from colder water, if desired. A shell-and-tube heat exchanger (*Figure 9*) is commonly used for this purpose.

system pressurizing

In some systems, the expansion tank may not be located high enough to give the desired working pressure. When this occurs, the system may be pressurized by other means, such as introduction of air or nitrogen into the system at a suitable point. A pressure cylinder, containing both liquid and the gas, is usually included as part of the system.

diversity factors

When computing the pipe and heater sizes for HTHW systems, frequent use is made of diversity factors. These are values, between 0 and 1.0, that express the amount of time the system or device will operate at full load. Usual values range between 0.4 and 0.9. The expansion tank, accumulator, and piping store a large amount of water capable of releasing heat.

To use a diversity factor, the heat load of the building or device is computed, using all relevant data. Then the actual heat that must be supplied is found by multiplying the computed heat load by the diversity factor. Since the diversity factor is almost always less than unity, the actual heat load will be less than the computed load.

other fluids

Though water has been referred to as the fluid throughout this article, other special fluids can be used, if desired or if necessary. These fluids are generally prepared especially for this service and are known by a trade name. Most of them are formulated to produce a low pressure when heated to a high temperature. The lower pressure allows use of cheaper piping and fittings, and may reduce the operating costs because licensed personnel may not be required. Special fluids may be used at temperatures to 1000F; water is seldom used above 425F.

materials

For best results from a HTHW system, the correct materials must be specified for the components. While the specific recommendations for various parts will vary from one designer to another, there are certain general recommendations. These are given below.

Pump casings are usually made of cast iron when the water temperature is 350F, or less. At higher temperatures cast steel is used for the casing. Steel piping, valves, and fittings are the most common choice because they have the best resistance to corrosion by the HTHW.

system costs

Converting a steam system to HTHW can develop fuel savings of 30 percent; in some installations the savings may be greater. The boiler and piping installation for HTHW generally costs 90 percent, or less, of an equivalent steam plant. The boiler and its auxiliaries generally cost about 15 percent less than a steam unit. Piping costs usually run about 20 percent less than for steam. Some plants report that their maintenance and other upkeep costs are only 25 percent of those for a similar steam system. Other plants say these costs run to 40 or 50 percent.

The actual costs for a given system, in dollars per sq ft area heated, or any similar unit, are extremely difficult to secure because they vary so much from one system to another. The reason for this is that each system must be individually designed. And, as this article has pointed out, the variations from one system to another can be extremely great. As with other elements in system design, costs are best studied for the given installation and analyzed in terms of its variables.

water treatment in air-conditioning systems

by W. J. Ryan*

Three of the principal problems that beset the operators of circulating-water systems are scale, corrosion, and slime growths. The character of the water will largely determine which problem predominates.

Throughout the greater part of the country, scale causes the most trouble. Every natural water contains mineral salts in solution in amounts ranging up to 500 parts per million (29 grains per gal), although most municipal supplies have a hardness not exceeding 200 ppm. As water is continually being evaporated in a cooling tower or evaporative condenser, and new water is continually being fed in to replace what is evaporated, and as the mineral salts do not pass off with the vapor, the concentration of hardness (mineral compounds) in the body of circulating water keeps increasing until these mineral salts are present in an amount that exceeds their solubility whereupon they come out of solution and form a hard stonelike deposit called scale.

The presence of this scale on heat-transfer surfaces greatly impairs their efficiency, and it causes clogging of the spray nozzles and circulating water lines and other parts of the system. Its removal can ordinarily be accomplished only by dissolving it with an acid solution, but some scales are almost insoluble even in the acids ordinarily used.

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Corrosion in a circulating-water system may be due in part to the naturally corrosive character of the water that is supplied, but is usually due in greater part to the absorption of acidic impurities from the air through which the water is passed in such equipment as cooling towers, evaporative condensers, and air washers. This is particularly true in large cities and industrial areas where the combustion of carbon and sulphur in fuels results in the presence of large amounts of carbon dioxide and sulphur dioxide in the air; and where the exhaust from automobile engines also contains large quantities of carbon dioxide.

Recent analysis of a number of water samples from cooling towers in the New York Metropolitan area showed that in many of them the pH was below 4.0, there was free mineral acidity present, and the water contained large amounts of iron and copper resulting from its corrosive action on the metals with which it was coming in contact. Under such conditions great damage can be done in a short period of time.

Slime growths result from molds and bacteria extracted from the air by the circulating spray water.

prevention of scale

As explained above, the concentration of mineral salts that takes place in evaporative equipment, plus the high temperature of some of the surfaces with which cooling water comes in contact, tends to cause formation of scale.

One procedure that is widely used to discourage scale deposit is to limit the concentration of mineral salts by bleeding to waste a part of the circulating water stream. From the analysis of the water, an experienced water chemist can estimate the number of concentrations that may be permitted.

Suppose that in a particular case the allowable number of concentrations is five. The amount of bleed can be computed by simple algebra as follows: The number of concentrations of mineral salts in the city water can be taken as one. The allowable number of concentrations in the circulating water is five.

Let E represent the amount of water being evaporated in a cooling tower.

Let B represent the amount to be bled to waste (or lost by windage and leakage).

Total feed water is $E + B$.

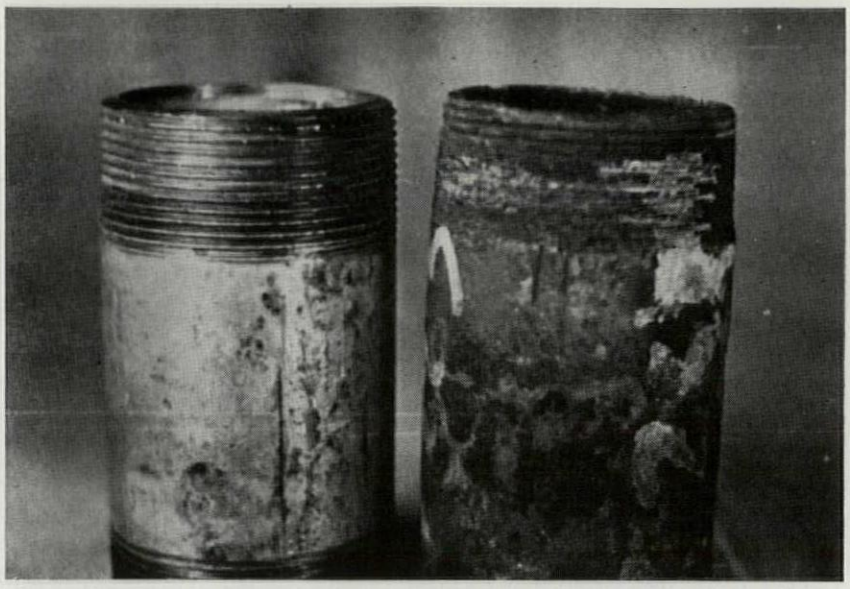
The amount of mineral matter entering the cooling tower, is $(E + B) \times 1$ concentration.

The amount of mineral matter leaving the tower is $(B) \times 5$ concentrations.

Since the amount of mineral matter leaving must equal the amount entering the cooling tower,

$$(E + B) \times 1 = (B) \times 5$$
$$E + B = 5B$$
$$B = \tfrac{1}{4}E$$

So the amount of circulating water that must be run to waste, to limit the number of concentrations of mineral matter to five, is one-fourth of the evaporation. It is usually estimated that the amount of water evaporated in a cooling tower is one percent of the circulation, so in



Steel nipples: nipple at right fell from elbow after six months' service carrying a circulating, cooling water having low pH. Comparison with new nipple at left shows extent of loss of metal at threads.

this case the bleed will be 0.25 percent of the circulation.

However, the loss of water by windage is usually taken as 0.15 percent of the circulation, and so the amount of water that must actually be bled to waste through a special bleed connection is 0.10 percent of the circulation. (This ignores possible leakage at the pumps or elsewhere.)

The rate of circulation in a cooling tower is usually three gpm per ton of refrigeration and, therefore, in the case we have been discussing the bleed will be 0.003 gpm per ton of refrigeration. Actually the windage loss, and loss by leakage will vary widely in different installations, and this will affect the amount of bleed required, but the theoretical amount of bleed can be calculated in the same manner described, and regular frequent analyses of the water will show how much the bleed should be.

Some cooling towers are designed with a built-in bleed connection consisting of a pan that catches and diverts to waste a certain portion of the spray water, but sometimes the amount of bleed for which the device is set is greater than necessary and, therefore, wasteful of water.

The same considerations that apply to bleeding water from cooling towers also apply to evaporative condensers.

Another procedure that is used for the purpose of preventing scale is to maintain in the circulating water a certain concentration of one of the sodium polyphosphates which have a sequestering action on the scale-forming particles thus tending to hold them in suspension until they pass out with the bleed.

If the water is very hard, it may be advisable to soften it by passing it through a softening apparatus such as a zeolite softener to remove as much as practicable of the hardness before the water enters the air-conditioning system; or if the hardness is mostly in the form of bicarbonates, the circulating water may be treated with sulphuric acid to convert some of the alkalinity to sulphates, which have a higher solubility and hence a lesser tendency to form scale.

Another reason for reducing the alkalinity may be to prevent delignification of the wood fill in a cooling tower.

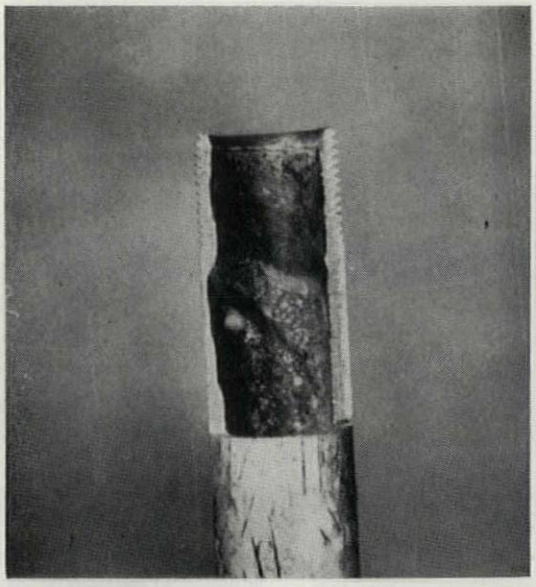
The best treatment can be decided on only after making a complete analysis of the water; it may be any one of the above described procedures—or it may be a combination of them.

the prevention of corrosion

If an air-conditioning system is supplied with soft water, such as those that predominate along the Atlantic seaboard, that does not deposit a coating of scale, corrosion is likely to be a problem. The circulating water in cooling towers, evaporative condensers, and air washers is continually in contact with air, from which it absorbs oxygen and corrosive gases, principally carbon dioxide (CO_2) and sulphur dioxide (SO_2) which are present in the flue gases from boiler plants and in the exhaust from automobile engines. As already stated, the circulating water in densely populated or industrial areas may absorb such a quantity of acidic impurities that the pH falls below 4.0 and there is free mineral acidity in the water. Even in areas where the air is comparatively pure, the absorption of acidic impurities is almost sure to give rise to a corrosion problem.

Numerous corrosion inhibitors are offered for the treatment of water to prevent corrosion. Some of them have given good results in laboratory tests where the treatment can be closely controlled, but have failed in situations where such control is not available. Regular analyses of the water and proper control of the rate of chemical feeding are essential if corrosion is to be minimized.

Sodium chromates have been particularly useful in controlling corrosion in circulating-water systems provided that sufficient alkali is also fed to maintain the pH in the range of about 7.0 to 8.5, and provided that a concentration of at least 200 ppm sodium chromate is maintained at all times. If for some particular reason it is desired not to use chromate, sodium nitrite is effective in concentra-



Galvanized-iron pipe perforated in six months. Area above and to right of hole has heavy copper plate. Circulating water had pH of 3.0 to 3.5.

tions of not less than 500 ppm, if the pH of the water is continually held above 7.0.

Sodium silicate has sometimes been used in the treatment of circulating waters. Uncontrolled amounts may lead to scale formation, but with careful control of the treatment it is possible to do a fairly good job of minimizing corrosion, without at the same time depositing scale.

slime growths

The sodium chromate that is used for preventing corrosion will discourage slime growths under ordinary conditions, but where special procedure is required, chlorine compounds may be added to the water to maintain a chlorine residual; or "shock" treatments may be applied with sodium pentachlorphenates or other slimicides. Mechanical cleaning, or in other words "good housekeeping" is also an essential part of any program for combatting organic growths. Where scrubbing or scraping is not practicable the use of high pressure steam may be effective.

air-borne solid matter

The atmosphere in populated areas is contaminated by soot and dust and other suspended particles which are caught by the circulating water in cooling towers and other such equipment. The accumulation must be kept under control by periodic draining and flushing of the reservoir basin of the equipment and perhaps by occasional draining of the whole system, to minimize the accumulation of troublesome deposits on heat-transfer surfaces.

The solids in the atmosphere include fly-ash and other possibly abrasive substances that may do damage to pump shafts unless their concentration is held to a minimum.

closed systems

The question sometimes arises—is it advisable to treat the water in closed circulating systems? Theoretically such systems are sometimes regarded as "closed" in the sense that the same water is supposed to stay in them indefinitely, and after its corrosive effect or scale-forming effect has been expended, no further action should take place. However, experience has demonstrated that the turnover of water in such a system may be high because of leakage at the circulation pumps or elsewhere and loss of water through relief valve, and the replacement water that is fed will cause troubles unless suitable treatment is applied.

Failure to maintain air pockets in the expansion tanks is one of the reasons for loss of water through relief valves.

general considerations

Chemical treatments such as those discussed herein can be used to the best advantage only if controlled by regular frequent analyses of the water to see if the desired concentrations of treatment chemicals are being maintained, and to see if the rate of bleed is correct. It is also necessary to employ chemical feeding devices that add the chemical solutions continually when water is circulating, at a rate sufficient to make up for chemicals lost by windage, bleed, and leakage.

Excessive leakage must be prevented if proper treatment is to be maintained without excessive consumption of chemicals. A defective and leaking ballcock on the makeup water line to a cooling tower or other piece of equipment may permit a continuous inflow of water to the system, with an equivalent amount of over-flow. Under such conditions proper treatment cannot be maintained. The same problem is created by excessive leakage at pump packing glands.

If a cooling tower is undersized, it is sometimes the practice to flood it by keeping the makeup-water valve open so that water flows in continuously and a corresponding amount passes out through the overflow. This may lower the temperature of the circulating a little, and thereby facilitate carrying the load, but it will prevent the maintaining of chemical treatment, and it will be very wasteful of water.

built-in kitchen equipment

An examination of kitchens—in houses of all types—that have appeared in the professional architectural journals during the last few years would reveal the relatively small prominence given to the kitchen, as far as space allotment is concerned. A similar observation could be made of the vast majority of merchant-builder houses being erected today. This minimum-space concept is evident, in spite of the disproportionate amount of activity that takes place within this area at least three times each day. An illusion of greater space, however, is often provided by the use of waist-high storage elements and work surfaces which serve as well to separate dining and living areas from the kitchen proper. The compactly designed contemporary kitchen appliances also release a significant amount of area that formerly would have been needed for bulkier equipment.

The architect who develops plans for a custom-designed house is generally limited, in his choice of kitchen equipment, to units that have been produced primarily to attract the builder market. Kitchen equipment is, however, improved and restyled each year in order to attract the mass market wherein the greatest volume of business lies. In his attempt to exhaust every possible opportunity to implement his sales, the builder will often try to make his standard house have a custom-designed look. Appealing to this desire, manufacturers are now

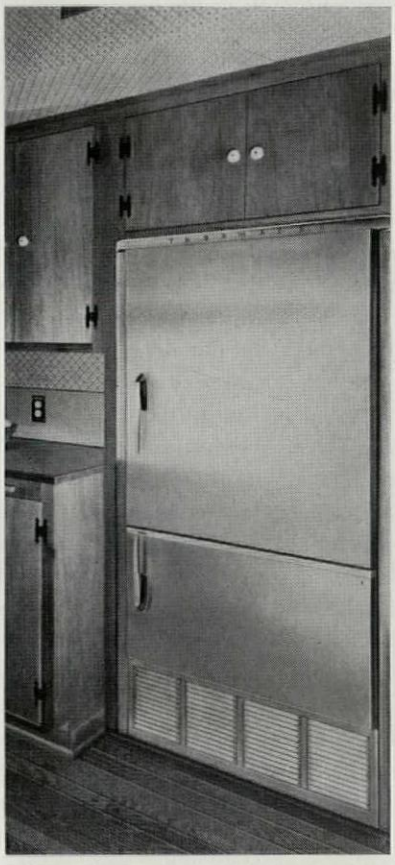
refrigerators



New-type refrigerator (left), *made of lightweight plastic and metals, can be cut to any size or shape. Has 13 cu ft capacity. Units average 150 lb less than steel models of same capacity.*
Westinghouse



Built-in freezer (below) *has 5.7 cu ft capacity. Contains aluminum liner and bonded-aluminum tubing; roll-out drawer for bulk packages. Temperature control goes to —20F.* Revco

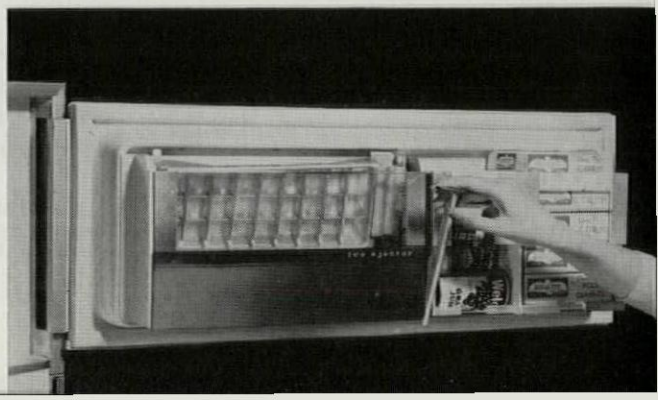


Combination refrigerator-freezer (above) *can be built in or used free standing. Cabinets and wall are flush with exterior of unit. Shoulder hinge eliminates door-clearance requirement. Available in four colors or white.* General Electric



Free-standing refrigerator (below) *can be built into wall with only face of door exposed. Features lever-operated ice ejector. Cubes cascade into storage and serving bin after lever has been pulled.* Frigidaire

This 14.2 cu ft refrigerator-freezer has 15.5 sq ft of shelf area. Freezer compartment stores 140 lb frozen food. Stainless-steel front; interior liners are acid-resistant porcelain enamel (right).
Thermador



placing far more emphasis on relating all components so that they appear to be part of the same style of design. In this connection there is a definite trend toward the concept of selling entire kitchens rather than individual pieces of equipment. Evidence of this is to be found in the "kitchen center" kind of design where the range, freezer, automatic dishwasher, sink, etc., are all incorporated into one unit. Built-in equipment, which gives the kitchen a more integrated appearance, largely eliminates surfaces that require constant dusting and cleaning. The very fact that primary appliances and cabinets are built in requires an increased amount of attention to the integration of various elements.

To spark the sales of their products and to offer selling ideas to builders, distributors, and other visitors to Appliance Park at Louisville, Kentucky, each year the General Electric Company erects there a group of model kitchens.

Electronic range (below) *cooks five-pound roast in 30 minutes. Microwaves create heat only in food and not in utensils and range interior. Food cooks from all sides at once.* **Kelvinator**



ovens

Double wall ovens (below) *have "French Door" design. Center-opening doors swing out—touch of one operates both. When opened, name plate moves forward automatically, deflects heat, and protects kitchen wall.* **Frigidaire**



Bi-level oven provides two ovens in same wall width as single unit (left). *Meat thermometer and rotisserie are featured.* **Hotpoint**

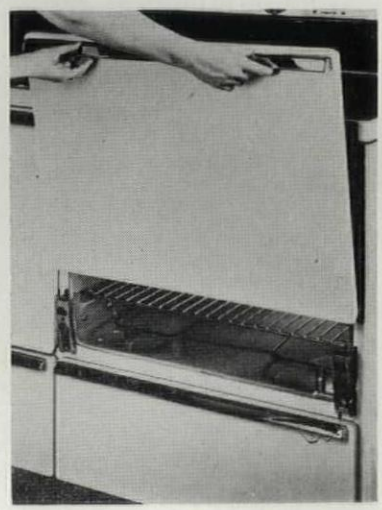
Electric oven and broiler (below) *broils without smoke—even with door closed. Cushion of insulating air completely surrounding unit and 47 lb of insulation insure cooler kitchen.* **Chambers**







Double oven (right) *requires less than 45" of wall width. Each oven has 6500 cu in. of usable space and has full length protective hood. Styled in stainless steel and trimmed in polished brass.* **Thermador**



This oven (right) *has removable doors for easy cleaning. A meat thermometer-alarm sounds buzzer when meat is done.* **General Electric**

Previously, the kitchens displayed were the work of one designer who expressed a wide variety of ideas and possibilities. For the 1957 exhibit, however, the editors of five leading consumer magazines were given the opportunity to create (with the aid of their staff architects) pace-setter kitchens from which ideas could be borrowed by visitors to Louisville. Each magazine editor was given complete freedom of choice in design and selection of products. It is significant to observe that four of the five model kitchens displayed a preferance for built-in equipment. This equipment included ovens, refrigerators, freezers, countertop cooking units, etc. Even though the fifth kitchen was thought of as "free-standing," each of the units was so well coupled with adjacent ones that the kitchen had a unified appearance.

Some of the manufacturers now produce units that may be used either free-standing or built in. A good example of this trend is found in some of the 1957 refrigerators. Cabinets may now be built flush with both sides, top, and back of these units. For previous models it was necessary to leave a gap of approximately six inches to accommodate the door swing. This area usually became cluttered with shopping bags, newspapers, and brooms. Automatic dishwashers are now available for undercounter or roll-away use. Built-in ovens and surface cooking units continue to gain in use.

cooking units



Stack-on, four-unit section (above) *fits over any standard 30 in. wood or metal base cabinet. There are no cutouts to make. Metal control panel contains meat timer, fluorescent lamp, four outlets, and push-button controls.* Hotpoint



Hinged top permits complete interior cleaning (left). *Unit also has seven-speed flip-up cooking elements and removable spill trays.* Chambers



Remote controls for this surface cooking unit can be located at any convenient location (above). *Unit has 8-in. and 6-in. cooking elements.*

Automatic appliance center (across-page) *provides current for five housewares—three pullout extension cords and two outlets. Center has automatic timer and selector dial.* Westinghouse



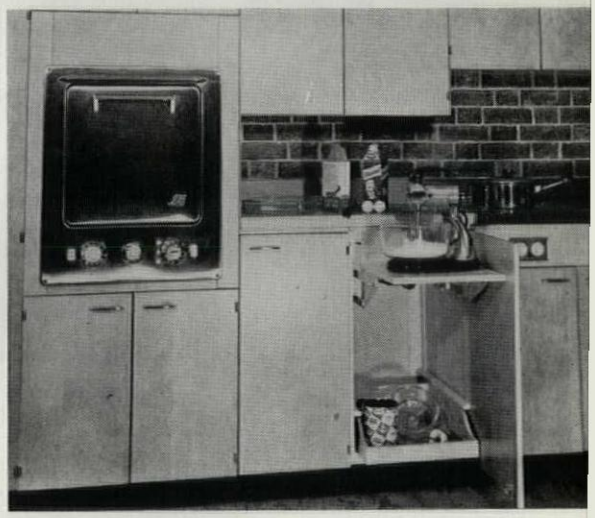
Built-in gas range (above) *has controlled-heat top burners. Prepares coffee, then keeps it serving-hot indefinitely. Won't burn, scorch, or boil over.*
Roper

Completely automatic dishwasher (right) *eliminates need for hand rinsing or scraping of dishes. Washer is designed to handle all food soil, after large food wastes have been removed.*
General Electric

Dishwasher built into steel cabinet (below). *Steel legs raise level of washer for easier operation.* Frigidaire

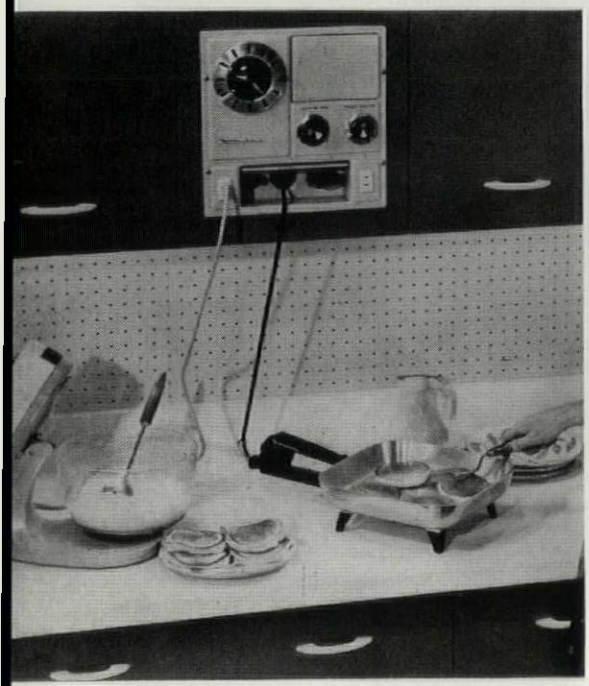


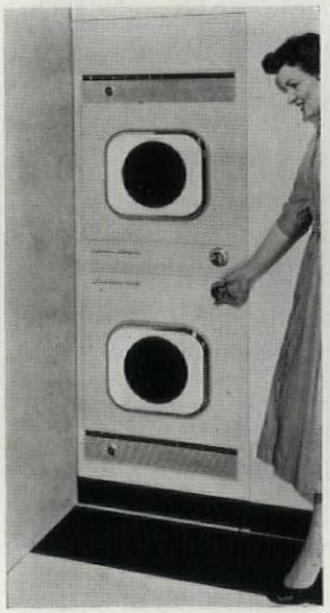




Oven unit (above) *is 24 in. deep and 64 in. high. May be used with gas or electricity. Mixer unit is 24 in. deep and 35 in. high. Locks in rigid position for use of mixer at table height.*
Curtis

other built-ins





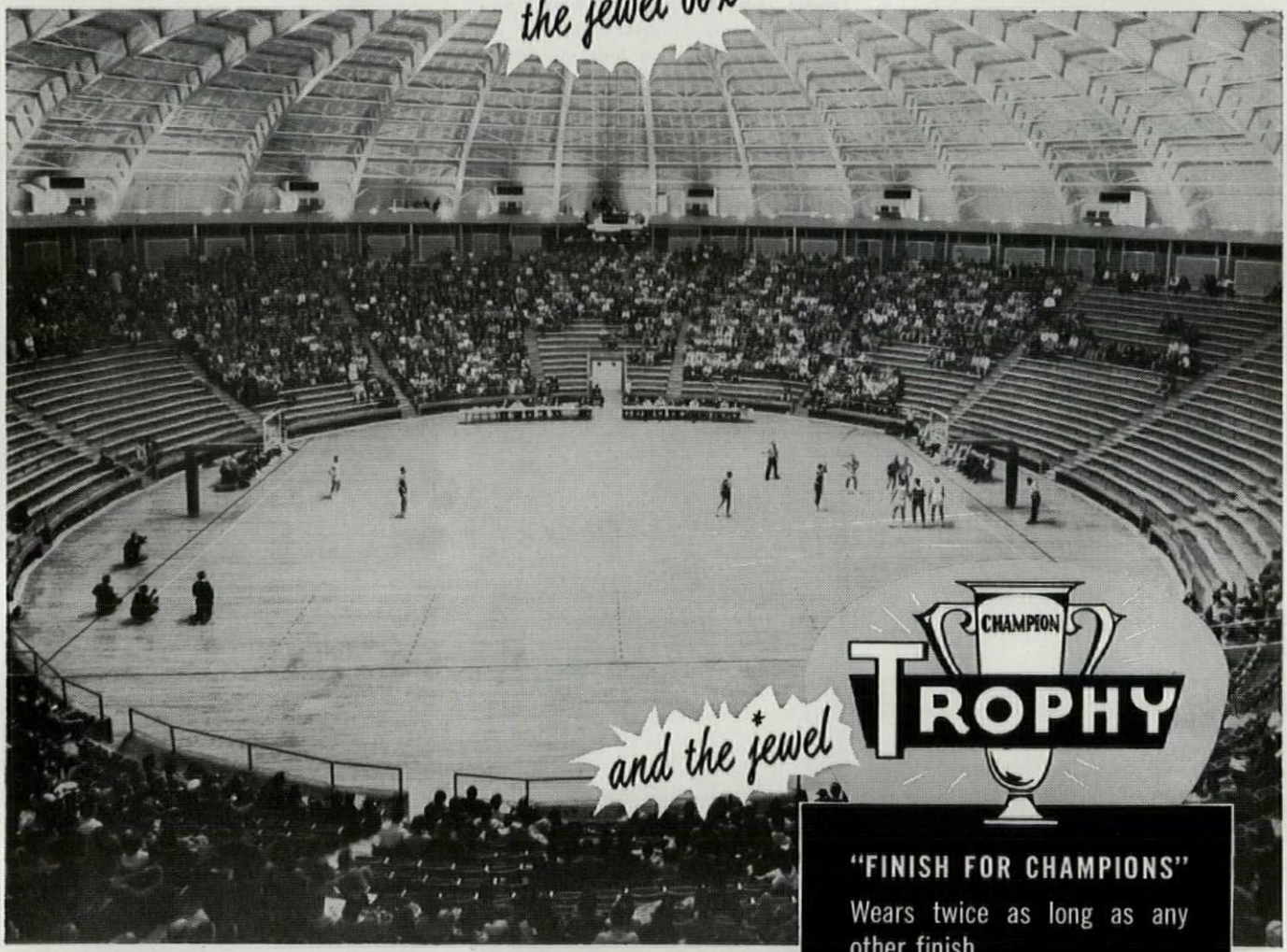
These units (left) *provide completely automatic clothes washing and drying in a floor space just 25 in. wide. Available in four colors as well as white.*
Westinghouse

The Big Dome

the jewel box

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Preparation of Earthwork Specifications

by Harold J. Rosen

Too many times a Contractor or an Owner lose out over poorly prepared earthwork specifications. The construction industry is enough of a gamble in itself—what with the logistics of bringing in men and materials in proper sequence, unforeseen rises in material and labor costs, strikes, bad weather, etc.—without penalizing both the Contractor and the Owner with poorly prepared earthwork specifications.

By writing definitive earthwork specifications, spelling out clearly what should be included in the Contractor's estimate and bid, and delineating those extra items which are unknown quantities, we will have taken a major step toward eliminating one of the risks in the construction industry. Firm bids should be based on known conditions, and it is unfair to both Contractor and Owner to pay for items which may or may not materialize during the course of earthwork operations.

Grandfather clauses which require a Contractor to excavate anything and everything he encounters can work both ways. While the Architect may feel he is protecting his Client by making the Contractor responsible under the contract for all of the unknown quantities such as rock, unmarked utility lines, and latent subsoil conditions, he may be inadvertently performing a disservice to his Client. The Contractor in order to protect himself must provide a contingency in his bid to take care of these grandfather clauses. If these unknown quantities do not manifest themselves during the earthwork operations the Contractor will have benefited at the expense of the Owner. If the Contractor has underestimated the unknown conditions, the Contractor can literally lose his shirt. In many instances, both parties to the contract may have to resort to the courts for a judicial determination of the equities involved.

In preparing definitive earthwork specifications, it would be well at the outset to modify Article 15 of the AIA General Conditions, if these are to be made a part of the contract documents, by using the following paragraph:

"Should the Contractor encounter, or the Architect discover, during the progress of the work, subsurface and/or latent conditions at the site materially differing from those shown on the drawings or indicated in the specifications, or unknown conditions of an unusual nature differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the drawings and specifications, the attention of the Architect shall be called immediately to such conditions before they are disturbed. The Architect shall thereupon promptly investigate the conditions, and if he finds that they do so materially differ, the contract shall, with the written approval of the Owner, be modified to provide for any increase or decrease of cost and/or difference in time resulting from such conditions."

Therefore, when the specification states that "All material now in place shall be removed as necessary for the performance of the contract," it implies that the Contractor must excavate to the required elevations and dimensions. However, if he encounters subsurface or latent conditions differing materially from that shown or specified, the contract price should be adjusted accordingly. The Contractor therefore bids without contingencies which reduce the cost to the Owner, and the Owner pays for only extraordinary conditions as they arise. If the Architect, through boring data, makes known these extraordinary conditions and includes this information as a part of the drawings and specifications, then the Contractor bids accordingly since he is dealing with a known condition.

To provide for firm bids, with respect to known and unknown utility lines which may be encountered during earthwork operations, the following paragraph may be used:

"Existing utility lines indicated on drawings, such as cables, ducts, conduits, and piping shall if damaged (unless they are to be abandoned) be immediately repaired, protected, and maintained in use until relocation of same has been completed, or shall be cut and capped where directed, or shall be prepared for service connections when so required.

"Any utilities encountered which are not indicated on the drawings and are to remain, if inadvertently damaged by the Contractor, shall be repaired by him, and an adjustment in the contract price will be made at rates determined and approved by the Architect. If extra expense is incurred in protecting and maintaining any utility line not shown on the drawings, an adjustment in the contract price will be made."

Where rock is likely to be encountered, the specifications may provide for this in several ways. An estimated quantity of rock may be established by the Architect and noted in the specifications with a stipulation that if a greater or lesser amount be encountered, the contract would be adjusted accordingly. This provides for firm bidding on the Contractor's part.

"——cubic yards of rock (as hereinafter defined) are to be excavated by the Contractor and shall be included in the contract price. However, the actual total amount of rock to be excavated shall be determined by cross sectioning and measuring the rock to be removed. Should a greater or lesser amount of such rock in place be encountered than the total estimated amount hereinabove noted, payment for any such greater amount or credit for any such lesser amount shall be made in accordance with the unit price agreed upon."

The specification may provide that all excavation be considered as earth, and that if rock is encountered, it be paid for at a stipulated unit price.

Where no information is available as to the existence of rock or other unknown conditions, the following statement will make for a firm bid:

"If rock, boulders over ½ cubic yard, or artificial material (such as old foundations, piles, etc.), are encountered which are not indicated on the drawings, an adjustment in the contract price will be made."

If rock is known to be present, payment lines should be specified so that any additional rock excavation is paid for within prescribed limits. A suggested specification might be as follows:

"In making rock excavation, no payment will be allowed for additional rock actually excavated beyond the following limits:

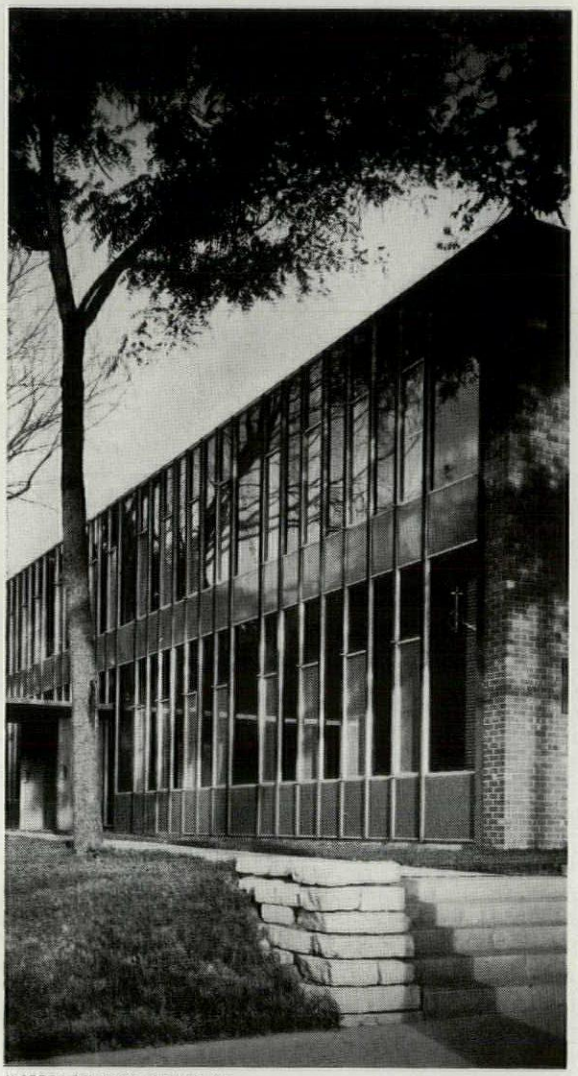
"1. Two feet outside wall lines above top of footings.

"2. One foot outside of the perimeter of footings.

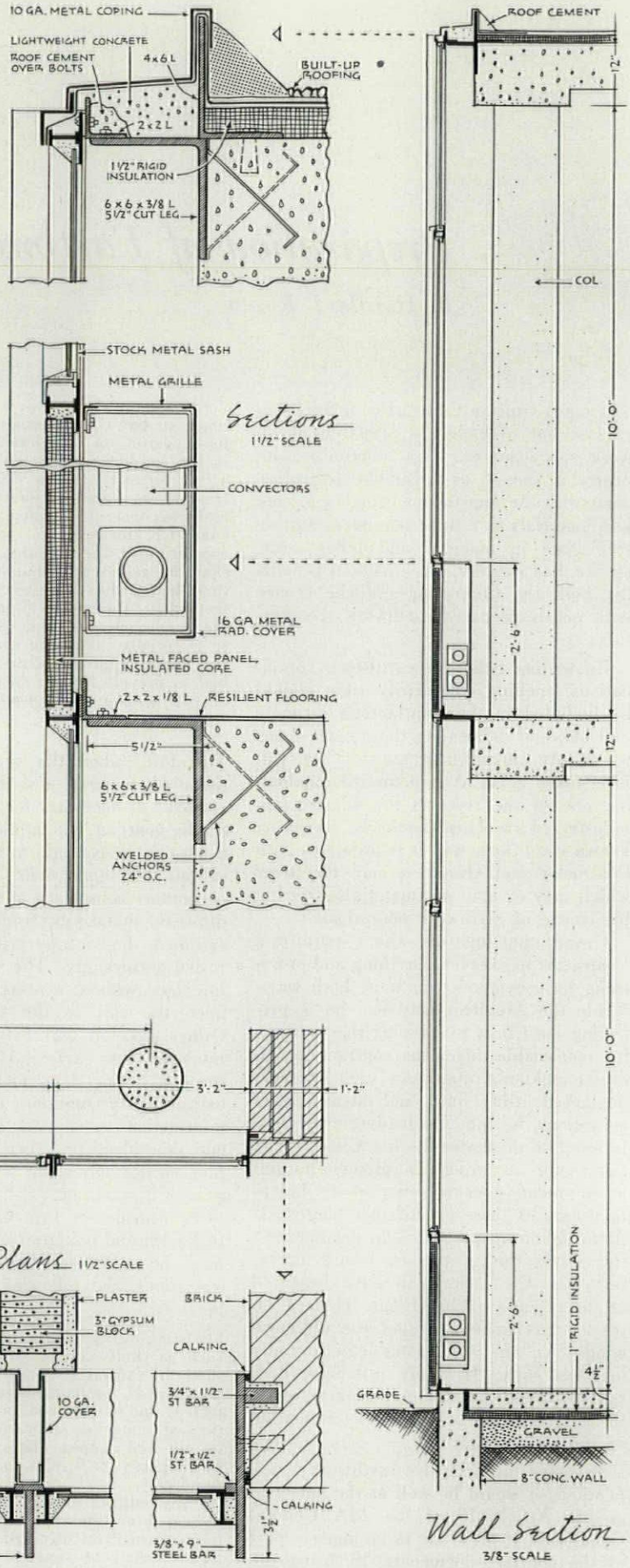
"3. In all pipe trenches, 8 inches below invert elevation of pipe and 2-feet wider than the inside diameter of the pipe but not less than 3-feet-minimum trench width.

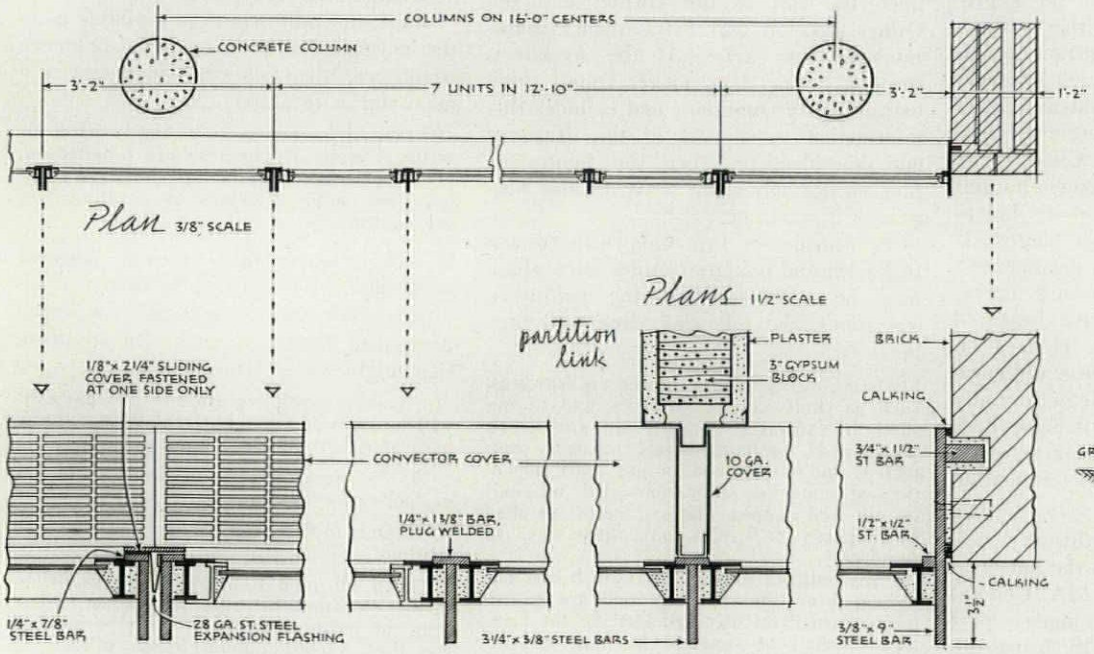
"4. Neat outside dimensions of concrete work for concrete trenches and concrete conduits where no forms are required."

wall section



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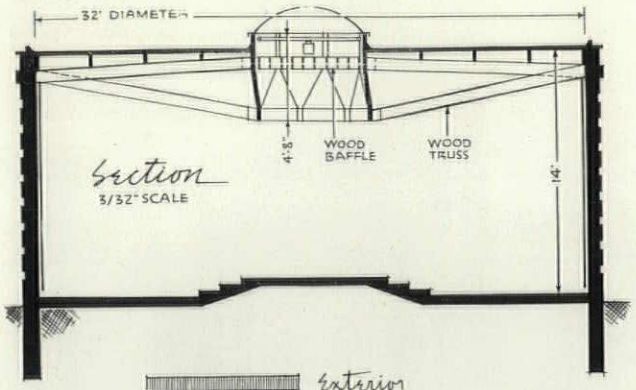


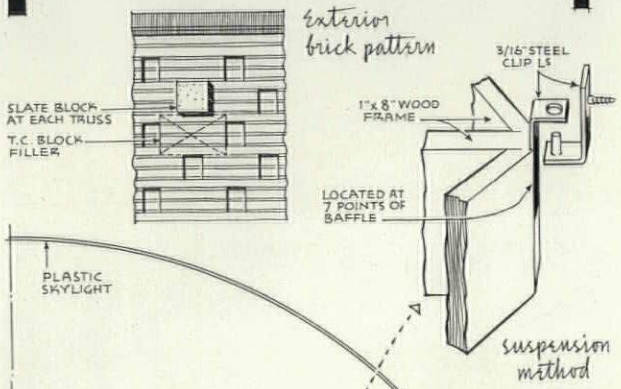


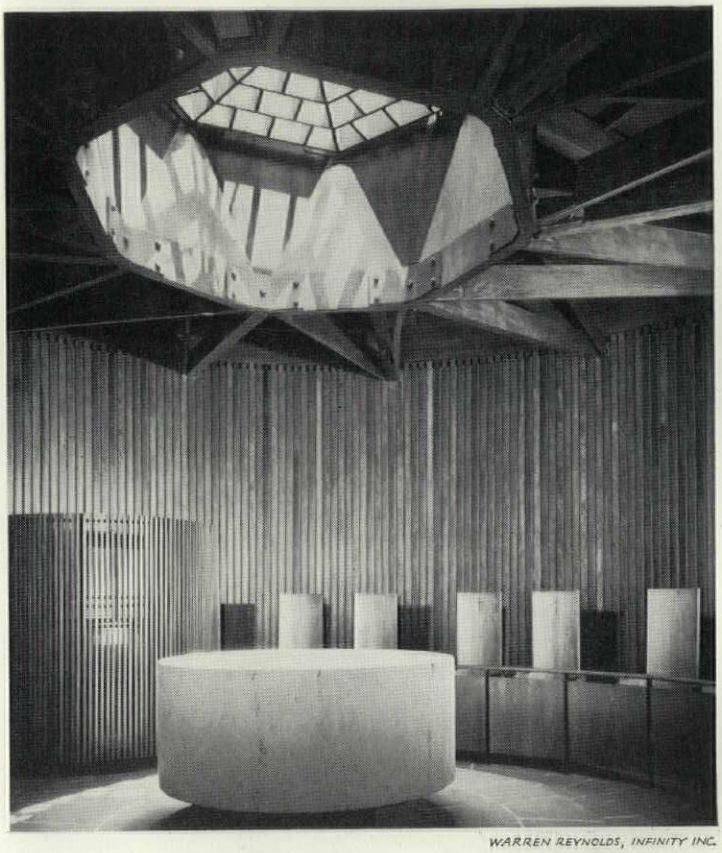
THEOLOGICAL SCHOOL, Des Moines, Iowa

Eero Saarinen & Associates, Architects

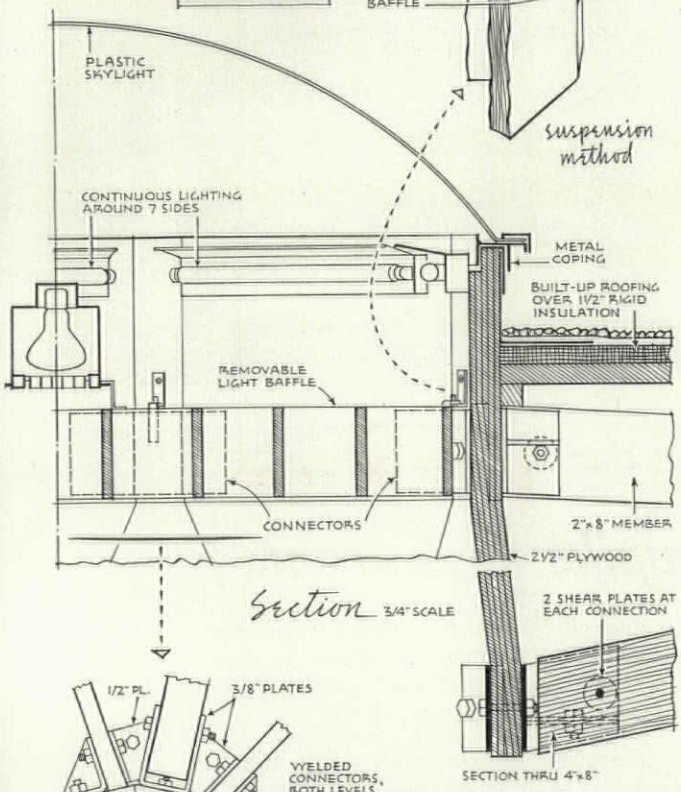
roof truss

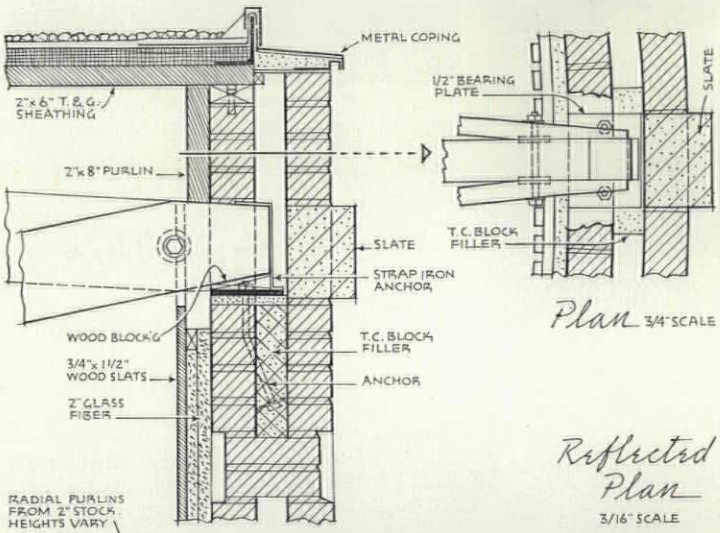


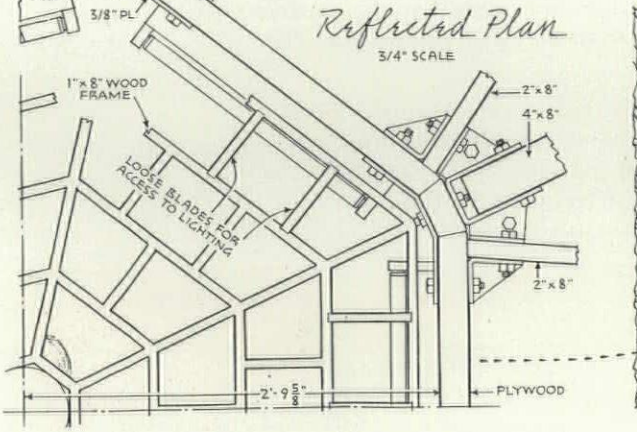


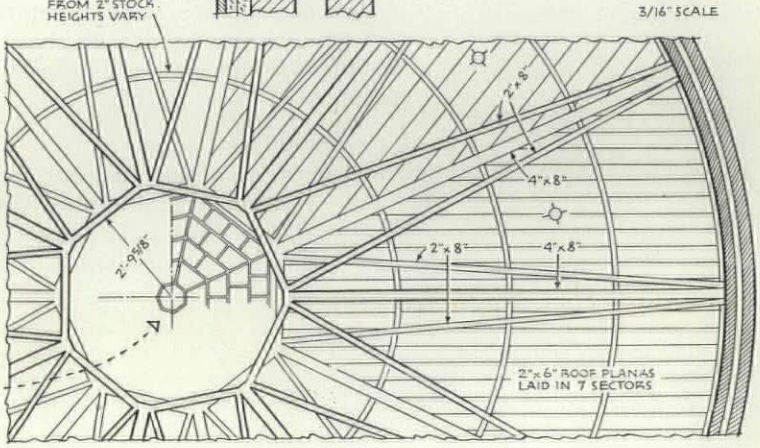


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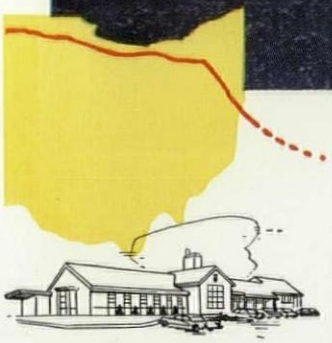




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Louise Sloane

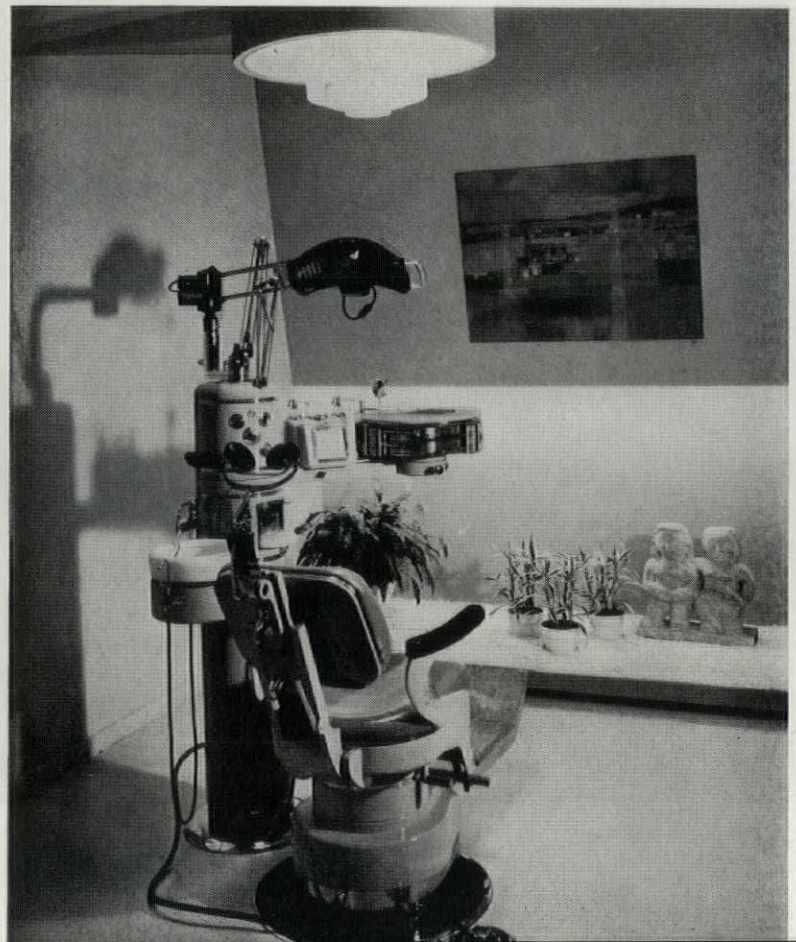
galleries

Interior design as a background for the fine arts is represented with distinction in this year's annual "Art in Interiors" exhibit at New York's Midtown Galleries; in New York's handsome new Museum of Contemporary Crafts; and in the imaginative Galeria Don Hatch in Caracas, Venezuela.

An architect, three decorators, and a designer created six settings as background for the paintings and sculpture of thirteen of Midtown's artists, continuing for the fifth year the Gallery's technique of illustrating three-dimensionally the creative use of original art in everyday living. Each setting is notable not only for its excellence of design, but also for the richness of detail achieved in quite small space.

Architect David Campbell, in remodeling a narrow building to accommodate the new Museum of Contemporary Crafts, expresses keen sensitivity to the character of the objects on exhibit. With color, line, and materials, he has provided a background fluidly appropriate to the display of the work of today's artist-craftsmen.

Equally interesting both for its purpose and its execution is the Galeria Don Hatch, founded by Architect Don Hatch in Caracas, Venezuela, as a center for creative contemporary work in textiles, ceramics, silver, crystal, and furniture, as well as a museum of contemporary art. Constantly changing exhibits demonstrate graphically, with dramatic impact, the richness of today's design output throughout the world. Discreet backgrounds permit the artist's work to tell its own story.

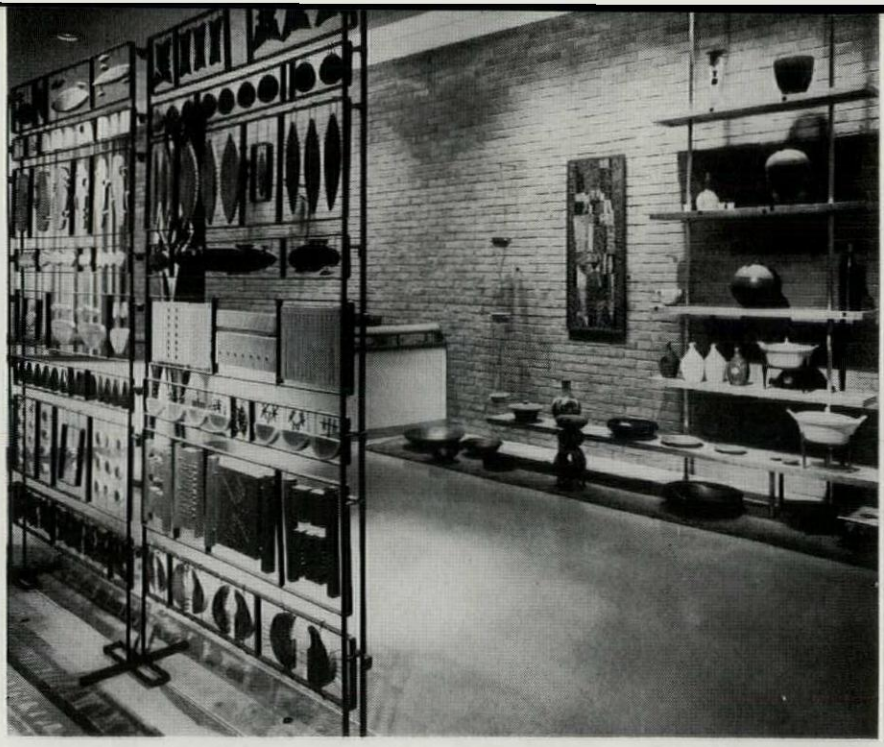


Architect David Leavitt blends Oriental and Occidental influences in a monochromatic living corner (top). *Paintings are by William Palmer; "Apple" and "Birds in Flight" sculptures by Arline Wingate. Platform benches are chamois-upholstered, walls linen-covered, rug black, white, and red.*

Designer William Pahlmann soothes the dentist's patient with a William Palmer painting, Arline Wingate sculpture, squash-colored ceiling and walls, yellow floor, and sky-blue equipment (left).

Settings at Midtown Galleries, New York, N. Y.

galleries



data

Color Plan: Arranged for the best possible viewing of objects. Floor light to reflect, not absorb, light. Side walls flat white, except in stair-hall landings, where strong color was used.

cabinetwork

Railings: architect-designed/ teak and maple/ Ried & Jaeger, Inc., 585 N. Barry Ave., Mamaroneck, N. Y.

furniture and fabrics

Dining - Room Tables, Receptionist's Desk, Library Desk, Library Shelving: teak and walnut/ architect-designed/ executed by craftsmen Alejandro de la Cruz, Tage Frid, John May, Borgen Mogensen.

Main Gallery Chairs: Daystrom Furniture Co., 206 Lexington Ave., New York, N. Y.

Upholstered Arm Chairs: P. Nathan & Son, Inc., 425 E. 53 St., New York, N. Y.

Drapery in Main Gallery: Menlo Textiles, Menlo Park, Calif.

Library Curtains: designed by Marion V. Dorn/ America House Ltd., 32 E. 52 St., New York, N. Y.

Lunch-Room Draperies: Jack Lenor Larsen, 16 E. 55 St., New York, N. Y.

Conference Room Draperies: Dorothy Liebes, 305 E. 63 St., New York, N. Y.

doors and windows

Flush Doors: Roddis Plywood Corp., Marshfield, Wis.

Fireproof Doors: National Metal Door and Buck Corp., subsidiary of National Kalamein Co., Inc., 420 Lexington Ave., Brooklyn 21, N. Y.

Glide Doors: Glide Windows, Inc., 7463 Varna Ave., N. Hollywood, Calif.

Aluminum Sash: Ludman Corp., 14100 Biscayne Blvd., N. Miami, Fla.

Large Glass: architect - designed/ Schnatz-Ogle, 891 E. 135 St., New York, N. Y.

lighting

Fixtures: Lightolier, Inc., 346 Claremont Ave., Jersey City, N. J.; Gotham Lighting Corp., 3701-31 St., Long Island City, N. Y.; Kliegl Brothers, 321 W. 50 St., New York, N. Y.

Dimmer Control Fixtures: Ward Leonard Electric Corp., 115 MacQuesten Parkway S., Mount Vernon, N. Y.

walls, ceiling, flooring

Walls: plaster/ canvas in gallery areas.

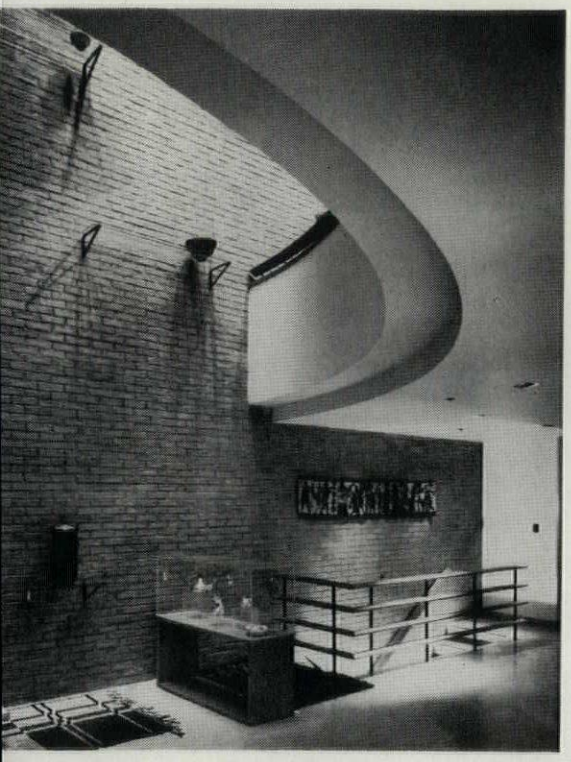
Ceiling: "Travacoustic"/ National Gypsum Co., 325 Delaware Ave., Buffalo, N. Y.

Floor: vinyl tile/ Robbins Floor Products, Inc., Tuscumbia, Ala.; asphalt tile/ Kentile, Inc., 58 Second Ave., Brooklyn, N. Y.

accessories

All: made by American craftsmen/ America House Ltd., 32 E. 52 St., New York, N. Y.





client	Museum of Contemporary Crafts
location	New York, New York
architect	David R. Campbell
displays	Thomas S. Tibbs
lighting consultants	Bernard Green and Richard Kelly



Structural design, selection of materials, and choice of colors all contribute to the illusion of space in a narrow building that might otherwise have looked cramped and crowded. The mezzanine is suspended between carrying walls, leaving large open wells at both ends. The north interior wall continues through a glass wall to a small garden area, and a horizontal window in the south wall leads to a small balcony-gallery, carrying the eye through the building's full width and breadth.

Photos: Louis Reens

galleries





client	Galeria Don Hatch
location	Caracas, Venezuela
architects	Oficina Don Hatch

The entire area is divided into three main galleries, with items from the permanent collection providing background decoration for current exhibitions. Included in the permanent collection are crystal from France, Holland, Arabia, Finland, Sweden, Italy; tapestries from France; rugs from Ecuador and Haiti; ceramics from Denmark. Natural-sisal wall-to-wall rugs, dark-brown ceilings, and white walls form the neutral color scheme, with accent panels in dark brown, dark gray, black, yellow, and green, providing focal points for groupings of furniture, textiles, silver, sculpture, paintings.

Photos: Petro Maxim





galleries





data

cabinetwork

All: in Venezuelan woods/ architect-designed/ executed by local artisans.

doors, windows, partitions

Doors: hollow-core/ African mahogany/ lacquered natural.

Windows: plate glass.

Partitions: permanent block and plaster dividing partitions/ hollow-core plywood on steel tubes, lacquered in color.

furniture and fabrics

Furniture: Knoll Associates, 575 Madison Ave., New York, N. Y.

Fabrics: Knoll Textiles, Inc.; A/B Nordisks Kompaniet, Hamngatan 18-20, Stockholm, Sweden.

lighting

Spotlighting: trolley duct, clip-on lights.

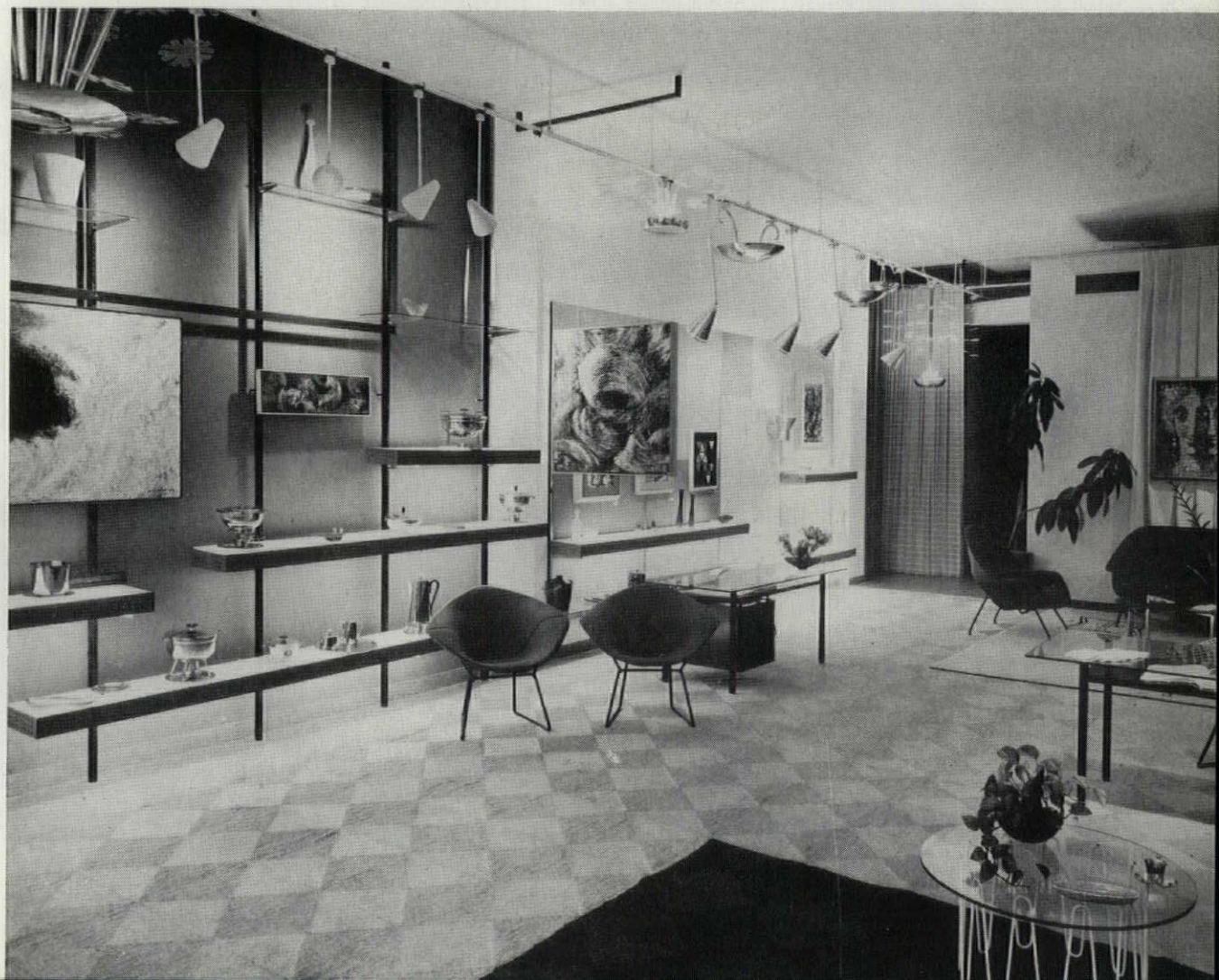
Fixtures: Paavo Tynell, A/B Taito, Finland.



Skilful integration of decorative and fine arts permits each to enhance the other. Room-suggestive arrangements of furniture and textiles in island groupings create an intimate, inviting effect.

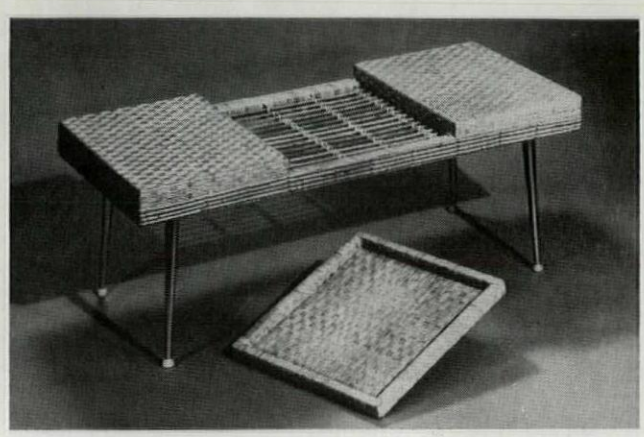
Galeria Don Hatch (continued)







"Boomerang" Chair: from Danish Craftsmen Collection/ open-back design with plastic-coated coil-spring supports/ brass fittings, chromium or brass legs/ frame and armrests of Bangkok teak, hand-rubbed oil finish/ **retail:** $96 (approx.) in muslin; **Coffee table:** 42" diameter, 15" high/ Bangkok teak with hand-rubbed oil finish/ **retail:** $93 (approx.)/ **John Stuart Inc., Fourth Ave. at 32 St., New York, N.Y.**

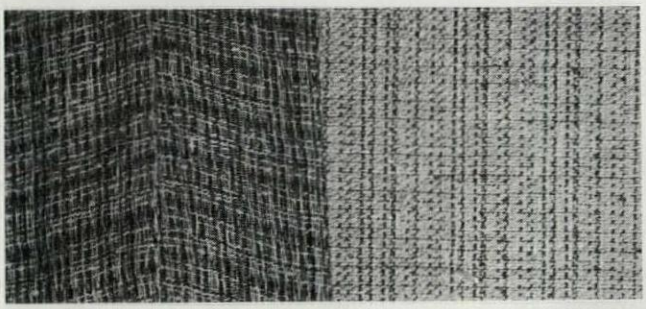


Outdoor-Indoor Pieces: Coffee table with rattan top/ removable service-tray slides out from top center/ 17" wide, 42" long, 16½" wide/ in pink, white, black, and newest color turquoise/ **retail:** $27.95 (approx.)/ also available in gold-anodized aluminum/ **retail:** $39.95 (approx.); cone chair/ of rattan with black, bonderized, tubular-steel frame/ single curve forms arm and leg/ **retail:** $27.95 (approx.)/ also available in gold-anodized aluminum/ **retail:** $29.95 (approx.)/ **Troy Sunshade Company, Troy, Ohio.**



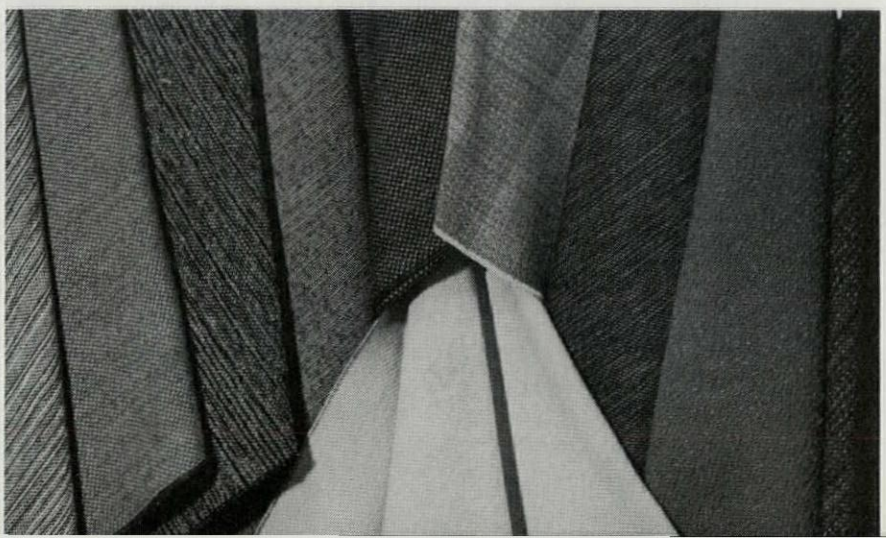
Side Chair: (left) of expanded-metal mesh and wrought iron/ suited to outdoor use/ carries Neva-Rust guarantee/ in Statuary, Bronze, Satin Black, Dusky Black, White, Citron, Shell Pink, Caribbean Blue, Blueberry, Aquamist, Flame, Dusky Flame/ **retail:** $44 (approx.) without cushion; $56 with foam rubber cushion/ **John B. Salterini Co., 41 E. 57 St., New York, N.Y.**





Co-ordinated Hand-Looms: (above left) open-weave casement of cotton, rayon, and linen; (above right) tightly woven upholstery fabric of cotton, natural linen, raw silk, and rayon/ designed by Katherine Choy/ **retail:** left, $20.25 yd (approx.), right, $26.25 yd (approx.)/ **Isabel Scott Fabrics Corp., 515 Madison Ave., New York, N.Y.**

Handwoven Textiles: (left) comprehensive group of custom-made upholstery fabrics and powerloomed casements/ of wool and wool combinations/ permanently mothproofed/ varied weaves/ 50 stock colors can be combined to customer's specifications/ designed by Norman Loring and Ellen Siegel/ **Rancocas Fabrics Showroom, 139 E. 57 St., New York, N.Y.**





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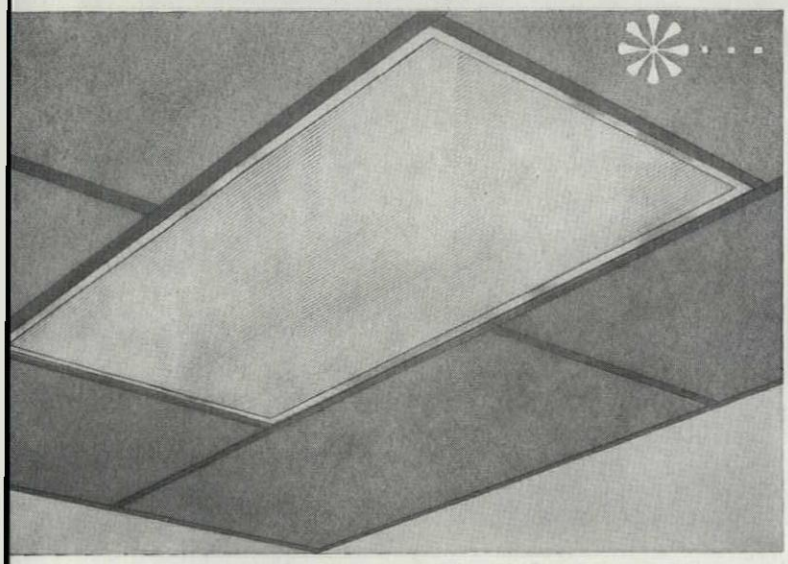
* Arthur W. Siegel, Massachusetts Representative, one of Smithcraft's nationwide sales organization

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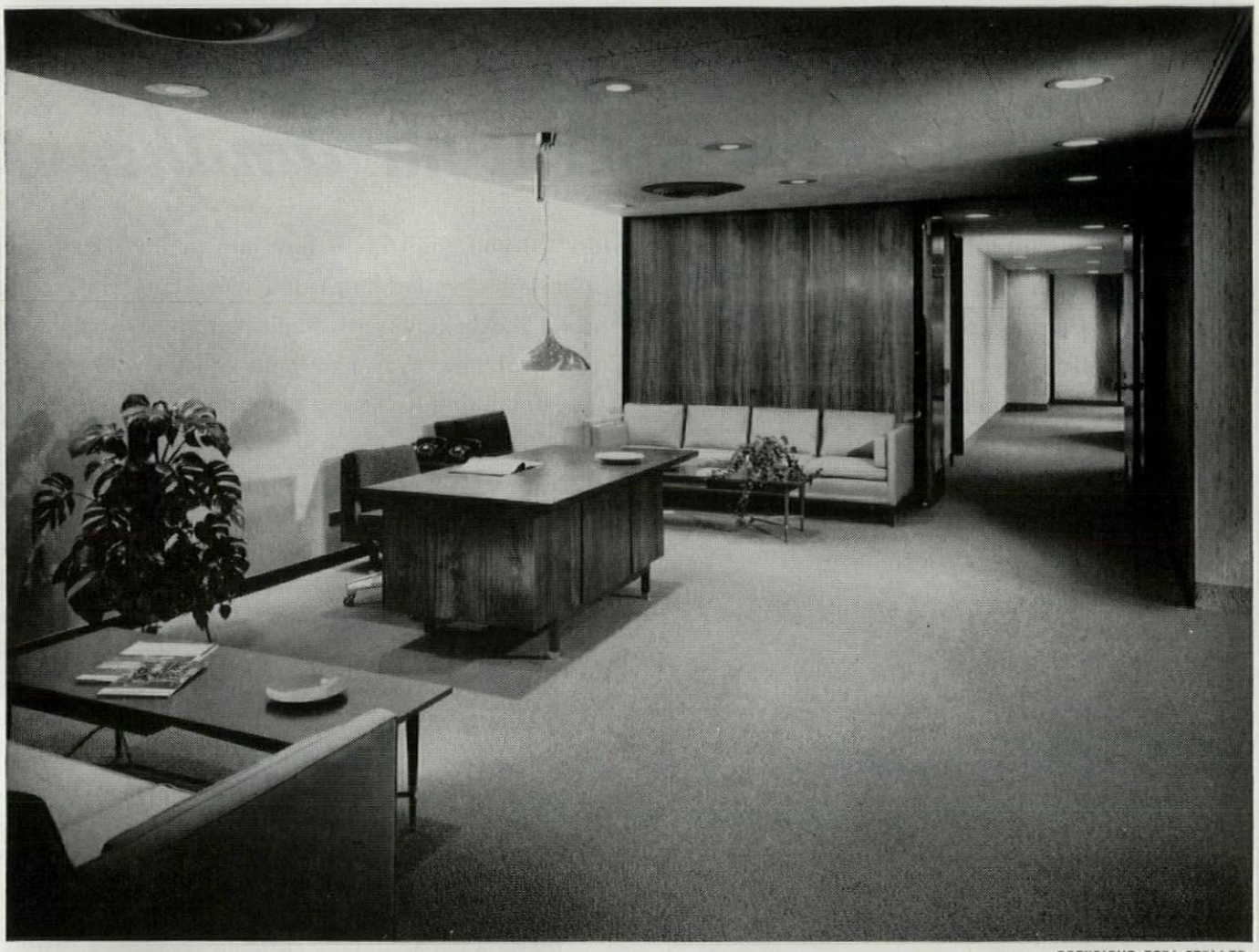
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Office buildings – such as the new Socony Mobil Building which contains over seven and one-half miles of carpet – find that for every 1000 square feet of floor space in heavy traffic areas, carpet saves an average of $194 a year, or 50.7% on maintenance costs.

The average cost, per 1000 square feet, of maintaining carpeted floors at accepted standards of maintenance averages $189 a year in heavy traffic areas. For non-carpeted floors, this figure shoots up to $383 – an increase of $194 a year for each 1000 square feet.

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Figure the floor space on the job you're now doing to see how much carpet can save your client. On top of this tremendous economy, carpet acts as a blotter to absorb noise and provides safe, sure, slip-proof footing. In general office areas, corridors, reception rooms and other heavy traffic areas, carpet will prove the most economical, most dignified, most practical choice for your clients.

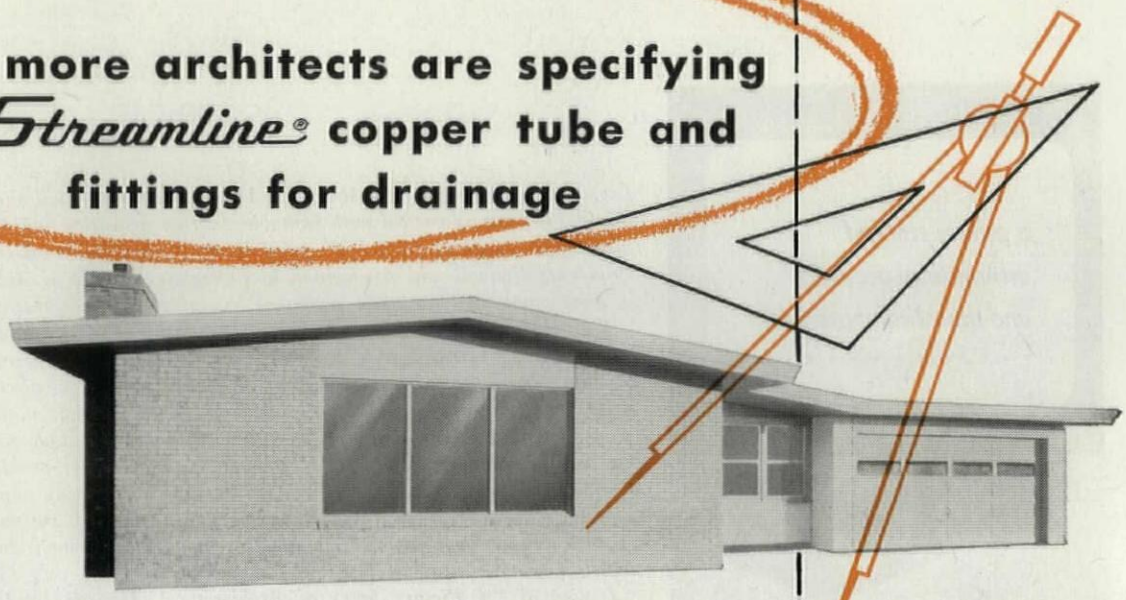
Send for your file copy of "CUTTING COSTS WITH CARPET," the complete breakdown of actual field costs on maintaining carpeted and non-carpeted floors. Write to Dept. A1, Carpet Institute, Inc., 350 Fifth Avenue, New York 1, N. Y.

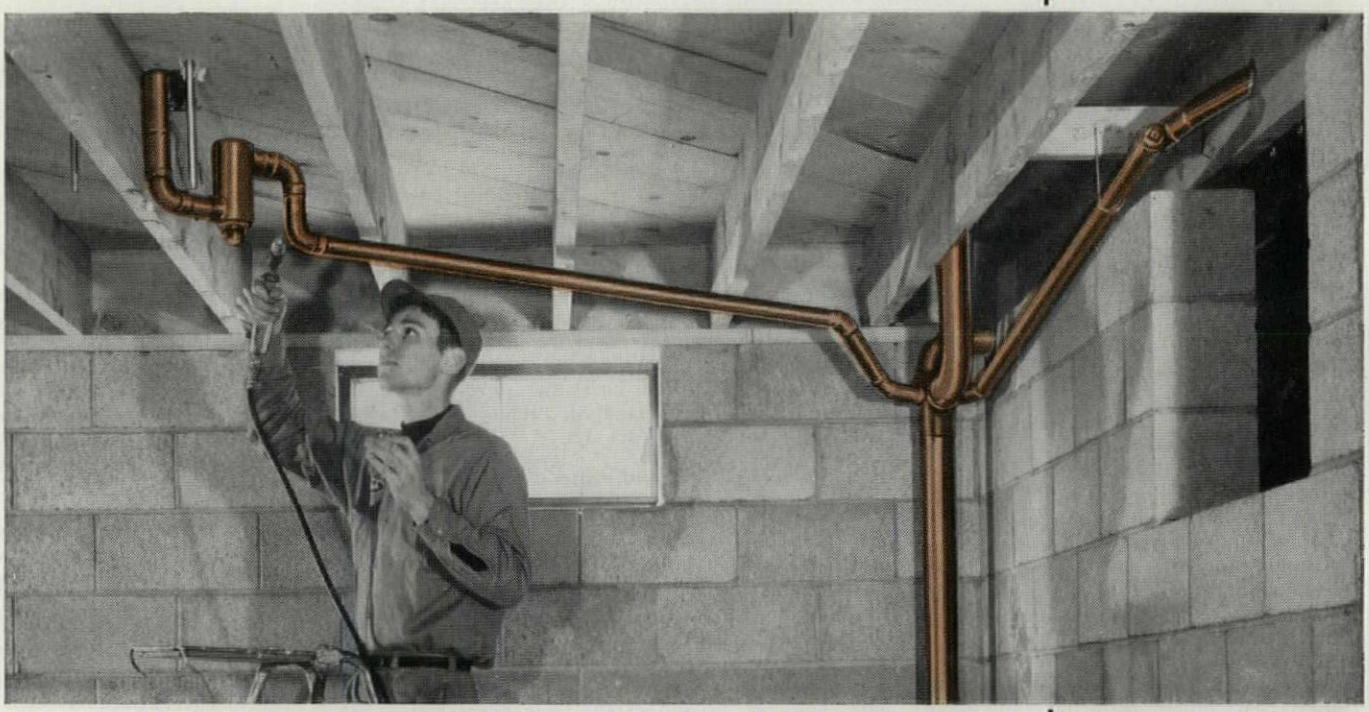
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It costs a little more, but the extra cost of a drainage system of copper is negligible when you compute its practical advantages.* When Streamline tube and fittings are used, it means a trouble-free future for your client's home.

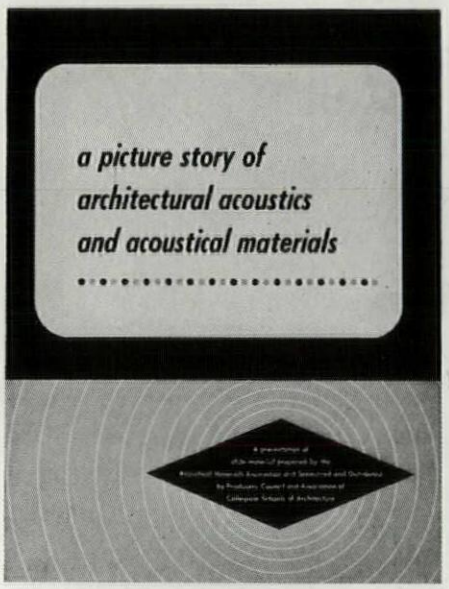
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⁂ Joseph F. Fehrenbach, licensed master plumber of Bridgeport, Michigan, installed the plumbing in the home shown here. He chose Streamline tube and fittings for drainage because it gave him an attractive, trouble-free installation for only $14.23 more than other competitive materials. He was able to do the job much quicker, too.

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Prepared by the Acoustical Materials Association from actual slide material, this publication is packed with valuable data on acoustics and the architectural applications of acoustical materials. As the literature—cosponsored by Producers Council and Association of Collegiate Schools of Architecture—is nonpromotional, no trade names or manufacturers are mentioned.

The booklet presents a sequence of miniature slide photographs with accompanying text which is broken by captions for easy reference. Scope of data ranges from basic definitions of sound, frequency, pitch, intensity, noise, and other pertinent terms, to discussion of installation methods for acoustical materials. In addition, the presentation covers such diverse topics as: how to make an acoustical analysis of an auditorium; problems due to sound reflection; sound transmission; methods for testing materials and general classification of these materials; discussion of various types of acoustical tiles—appearance, maintenance, and installation; recommendations for treatment of specific interior spaces.

Copies of "A Picture Story of Architectural Acoustics and Acoustical Materials," 16-p., are available from Acoustical Materials Association, 57 E. 55 St., New York, N. Y. R.C.

★ *Editor's Note: Items starred are particularly noteworthy, due to immediate and widespread interest in their contents, to the conciseness and clarity with which information is presented, to announcement of a new, important product, or to some other factor which makes them especially valuable.*

air and temperature control

190. Trane Centravac. 56-p. data book on automatic hermetic centrifugal water chiller for air-conditioning and process systems. Discusses features, controls, and installation of unit composed of two-stage motor-driven centrifugal compressor, shell-and-tube type evaporator and condenser of similar construction. Numerous photos, drawings, and diagrams illustrate components and operation of system. Outlines selection procedure; offers charts of dimensions, capacity ratings, water pressure drops. The Trane Co., La Crosse, Wis.

191. Emerson-Quiet Kool Air Conditioner, 6-p. folder featuring individual-room heating/air-conditioning units for all types of buildings. Lists advantages of unit designed for flush installation into exterior wall. Describes automatic operation of damper controls and thermostat. Exploded views, elevations, specifications. Emerson-Quiet Kool Corp., 46 Oliver St., Newark 5, N. J.

192. Dunham-Bush Baseboard Heating, AIA 30-C-44, 16-p. publication providing data on baseboard heating equipment which utilizes either forced warm-water or two-pipe steam system. Describes design features; offers installation details for semirecessed or flush-type baseboards. Outlines installation procedure; shows selection of baseboard designs for home or office with component parts and accessories. Typical circulation layouts, capacity charts, ordering data, specifications. Dunham-Bush, Inc., West Hartford 10, Conn.

193. Self-Contained Remotaire, AIA 30-F-1-2, 6-p. bulletin covering individual room air conditioners with self-contained refrigeration circuit and heating connections. Shows internal mechanism of mounted unit and exterior aluminum grill. Keyed illustrations denote design features such as built-in control panel, removable chassis, hermetically sealed motor-compressor assembly. Dimensioned drawings, capacity ratings. American-Standard, Plumbing & Heating Div., New York 18, N. Y.

194. Vornado Air Conditioners, 16-p.

195. Vornado Air Circulators, 16-p. Two four-color catalogs exhibiting line of stylish residential cooling equipment. First catalog presents compact 16" deep air conditioner with rotating louvers and dual air filters for installation in window or wall. Also displays models with rotating nozzle circulators. Cutaways and capacity data included. Second catalog introduces handsome styrene-cased fans that circulate and filter air. Illustrates selection of floor, window, and pedestal-type fans with unusual custom features. O. A. Sutton Corp., Wichita, Kans.

ARI Air-Conditioning Standard, 20-p. edition of latest ARI application engineering standard for air conditioning multizone buildings. Data, completely revised from 1947 document, sets minimum conditions and factors that form basis of design load estimations and specifications. Tables cover: outside design conditions; sensible heat gain through glass; heat gain from occupants and appliances; transmission; ventilation and infiltration; refrigeration load. Includes sample form for cooling and heating load estimates. Request from: Air-Conditioning and Refrigeration Institute, 1356 Connecticut Ave., N.W., Washington 6, D. C.

196. Copper Tube Panel Grids, 28-p. guide to installation and design of residential radiant heating system using preformed, copper tube panel grids. Discusses principles of radiant panel heating; explains advantages of new system with flexible center spacing that simplifies adaptation to any plan arrangement. Diagrams suggest variety of grid designs for floor and ceiling as well as methods of indicating grid layout in drawings. Gives installation procedure with photo illustrations. Charts, drawings. The American Brass Co., Waterbury 20, Conn.

197. Metalbestos Safety System, 16-p. booklet presenting tables for determining safe, individual or multiple gas vent installations for any type of approved gas appliance adaptable to type B gas vents. In addition, provides general data on venting and fundamentals of vent design as well as suggestions for installation of combined vents. Diagrammatic illustrations. Metalbestos Div., William Wallace Co., Belmont, Calif.

198. Agitair High Pressure Terminals, 16-p. catalog brochure on series of high-pressure terminals used with conventional diffusers for control and distribution of air in high-velocity systems. Gives background data on high-velocity air distribution and function of components; shows terminals for single-, dual-, and perimeter-duct applications with data to facilitate selection. Charts, photos, diagrams, specifications. Air Devices Inc., 185 Madison Ave., New York 16, N. Y.

199. Bryant Heating & Cooling Equipment, 32-p. catalog reviewing line of gas- or oil-fired heating units and water-cooled or waterless air conditioners for variety

of residential installations. Describes special features and advantages of forced-air and gravity furnaces, boilers for hot-water and steam-heating systems, central and auxiliary-type cooling units, unit heaters, and hot water heaters. Photos, cutaways, capacity data. Bryant, 2020 Montcalm St., Indianapolis 4, Ind.

construction

259. Steel Buildings, 4-p. bulletin describing four types of steel buildings composed of interlocking panel ribs for use as schools, churches, or factories. Gives data on rigid frame, truss, and frameless designs with exploded views showing assemblies. Provides tables of specifications and clear span widths. Product Information Service, Armco Drainage & Metal Products, Middletown, Ohio.

260. Erie Porcelain Enamel, 8-p. sketchbook illustrating installation of two basic porcelain-enamel panel designs: insulated 1⅛" panel for use in standard metal sash frames; filled and insulated 2" panel designed for suspension in mullion bar system. Descriptions, technical data, and specifications accompany detail drawings. Also supplies data on pan-type panels for application as veneer over masonry or other wall surfaces. Erie Enameling Co., Erie, Pa.

Typical Lumber Designs, AIA 19-B, 16-p. 1957 edition of handbook listing large variety of lumber designs using Teco structural connections. Designs range from basic types of trussed rafters and heavy roof trusses to highway structures and farm buildings. Provides: data on spans, depths, spacings, and loads; descriptions; outline drawings; instructions for ordering complete information on any design listed. Request from: Timber Engineering Co., 1319 18 St., N.W., Washington 6, D. C.

★ **261. Steel Joist Bridging,** AIA 13-G, 16-p. synopsis of tests made on short-span open-web joists to determine most effective type of bridging. Presents charts compiled from results of three series of tests along with observations and conclusions. Drawings, diagrams, and photos illustrate report. Steel Joist Institute, Dupont Circle Bldg., 1346 Connecticut Ave., N.W., Washington 6, D. C.

Recommended Practice for Winter Concreting, 24-p., 75¢
Building Code Requirements for Reinforced Concrete, 76-p., $1.00

Two new ACI Standards in handbook form. First handbook, reprinted from June 1956 *Journal of American Concrete Institute*, recommends methods for protecting concrete and maintaining proper curing conditions during cold weather. Discusses use of antifreezes, heating of materials, subgrade preparation, and protective coverings. Graphs show how temperature effects strength of concrete. Second booklet presents building code requirements governing design and construction of reinforced concrete buildings. Covers: allowable stresses, use and quality of concrete, forms, reinforcement, anchorage, slabs, columns, walls, footings, and precast concrete. Send remittance to American Concrete Institute, 18263 W. McNichols Rd., Detroit 19, Mich.

262. Lexsuco Roof Constructions, AIA 12-A, 8-p. catalog describing construction of fire retardant roofs. Illustrates application and advantages of nonflammable adhesive, special vapor barrier, steel and wood insulated decks, rust preventing insulation clips. Photos, dimensions, diagrams. Lexsuco, Inc., Dept. PA-12, 4815 Lexington Ave., Cleveland 3, Ohio.

263. Prestressed Concrete Products, AIA 4-E-12, 8-p. bulletin containing data on prestressed precast concrete double-tee roof and floor slabs. Describes advantages of product in terms of structural strength and clean design; supplies three full-page safe-load tables. Includes cross sections of slabs and details showing double-tee and end connections. Specifications. Leap Concrete, Inc., P. O. Box 1053, Dept. 2, Lakeland, Fla.

doors and windows

386. Ador Sliding Glass Doors, AIA 16-E, 12-p. pamphlet describing all-aluminum glass sliding doors for residential applications in all climates. Cutaways show weatherstripping at threshold, header, interlocker, and jamb. Photos indicate precision design of sliding mechanism utilizing stainless-steel track and steel roller bearings. Also stresses corrosion resistant finish, snap-on glazing bead, and custom hardware. Shows installation procedure; provides installation and glazing details, full-size construction details, dimensions. Ador Sales, Inc., 2345 W. Commonwealth Ave., Fullerton, Calif.

387. Vampco Aluminum Windows, AIA 16-E, 48-p. product guide presenting variety of aluminum windows for commercial and industrial installations. Sections cover: hand- and pole-operated hardware; intermediate projected windows; combination casement/projected windows; tubular windows; window wall. Shows extrusion shapes, standard sizes, installation details. Valley Metal Products Co., Plainwell, Mich.

electrical equipment, lighting

477. Better Patient Care, 12-p. booklet describing communication systems designed to facilitate operation of hospitals. Features audio-visual nurse call system; shows desk and wall-mounted nurse control stations, bedside call boxes, office intercom networks. Describes centrally controlled under pillow speakers for entertaining patients; suggests locations and typical applications. Photos. Executone, Inc., 415 Lexington Ave., New York 17, N. Y.

478. Church Lighting, 8-p. brochure showing lighting fixtures for contemporary and traditional churches. Features ornamental, pendant, and wall-mounted lanterns to harmonize with existing Gothic, Colonial, or Georgian interiors; simple, contour-form fixtures to complement modern interiors; recessed reflectors for auditorium-type spaces where inconspicuous, high-intensity lighting is desirable. Photos of actual installations. Pittsburgh Reflector Co., Oliver Bldg., Pittsburgh, Pa.

479. Milcor Celluflor, 16-p. booklet containing information on cellular steel subfloor which serves as both electrical duct system and lateral reinforcement in concrete slab construction. Lists advantages in economy and flexibility; provides formulas, charts, and tables for determining proper gage and form of steel sections for different loads, spans, and bearing requirements. Construction details show typical applications at critical points. Drawings, specifications. Inland Steel Products Co., 4139 W. Burnham St., Milwaukee 1, Wis.

480. Silvered Bowl Lamps, 16-p. catalog on fixtures using silver-coated bowl lamps which combine advantages of high efficiency light source and control reflector in single incandescent bulb. Photos and details show silvered bowl lamps installed with metal eggcrate louvers and plastic or glass diffusers as well as wall-to-wall ceiling system where deflected light from one bulb illuminates adjacent plastic panels. Illustrates series of recessed, surface, and pendent-mounted fixtures with concentric ring reflectors; compares cost and effici-

(Continued on page 188)

PROGRESSIVE ARCHITECTURE, 430 Park Avenue, New York 22, N. Y.

I should like a copy of each piece of Manufacturers' Literature circled.
We request students to send their inquiries directly to the manufacturers.

190	199	478	636
191	259	479	637
192	260	480	843
193	261	481	844
194	262	519	845
195	263	520	846
196	386	633	847
197	387	634	848
198	477	635	64

please print

Name _____

Position _____

Firm _____

Mailing Address _____

City _____ *State* _____

Coupon must be used by 4/1/57.

p/a manufacturers' literature

(Continued from page 187)

ency with ordinary frosted bulb. Technical data, dimensions. Skylike Lighting, Inc., R. K. O. Building, N. Y.

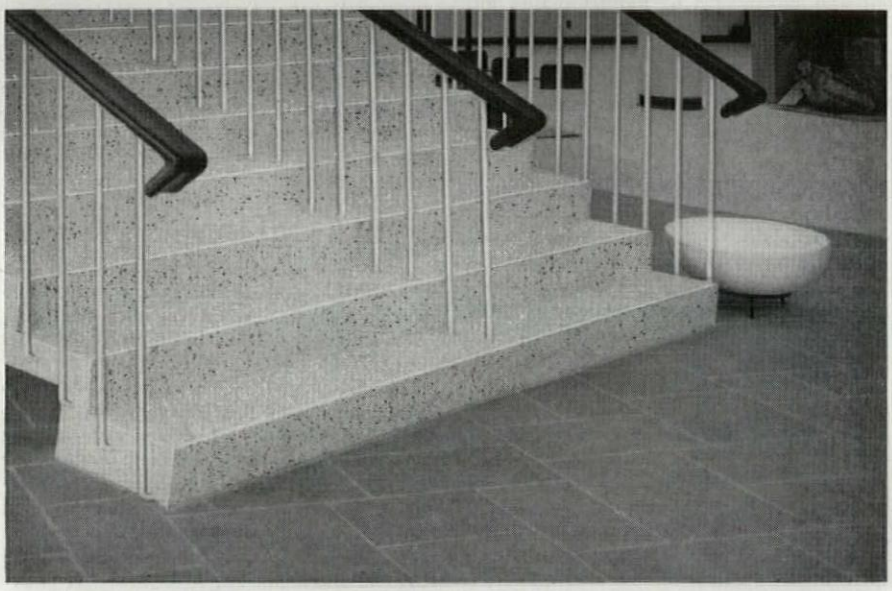
★ **481. Compound Diffraction Projector,** 24-p. handbook offering complete data on public address loudspeaker system operating on diffraction principle. Analyzes limitations of commonly used sound equipment; gives thorough description of components, performance, and application of system utilizing two coaxial horns for high-quality projection of voice and music. Outlines method for making sound surveys; discusses public address requirements for auditoriums, stadiums, and large interior rooms, with reference to basic acoustical principles. Text is illustrated with numerous diagrams, graphs, and photos. Includes architect's specifications. Electro-Voice, 404 Carroll St., Buchanan, Mich. 35¢

finishers, protectors

519. Why Hot Spray, 28-p. pocket-size booklet outlining advantages of hot spray process which claims growing industrial acceptance. Introductory data defines hot spray as method of applying controlled heat to finish materials to maintain constant viscosity. Actual case histories are related; spray equipment is illustrated. Final section, in question/answer form, gives realistic appraisal of potential uses and limitations of process. Photos, drawings, graphs. Spee-Flo Co., 720 Polk, Houston, Tex.

520. How to Make Dry Basements, 16-p. pocket-size booklet probing causes of basement dampness, describes symptomatic conditions, and proposes such remedies as water proof cement, paste, powder, and paint. Indicates area where protection in new construction is prerequisite; outlines procedure for applying waterproof compounds to concrete or cement plaster. Medusa Portland Cement Co., 1000 Midland Bldg., Cleveland 15, Ohio.

Naugatuck LATICRETE



gives terrazzo new versatility!

LATICRETE terrazzo is essentially Portland cement and marble chips mixed before use with a specially compounded *rubber latex*. And what a difference the rubber makes! For example, as a binder for terrazzo, Laticrete® is:

- **More tenacious**—permits toppings of less than half an inch; holds marble chips tighter; facilitates finishing.
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- **More resilient**—absorbs heel clicks, feels more like wood underfoot.
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- **Light in weight**—a thinner topping means lower floor loading.
- **Chemical resistant**—more durable in more locations.
- **Readily pigmented**—for colorful beauty.

Laticrete's novel properties offer you many new possibilities for both new construction and remodelling. We'll gladly send you more complete details on request.

United States Rubber
Naugatuck Chemical Division
Naugatuck, Connecticut

BRANCHES: Akron • Boston • Chicago • Memphis • New York • Philadelphia • **Mfg.:** Naugatuck • Gastonia • Los Angeles • **Canada:** Latex Div., Dominion Rubber Co., Ltd., Montreal • **Cable:** Rubexport, N.Y.
Rubber Chemicals • Synthetic & Reclaimed Rubber • Plastics • Agricultural Chemicals • Latices

insulation (thermal, acoustical)

633. Perforated Metal Sheets for Sound Control, 6-p. nontechnical bulletin describing application of perforated-metal sheets for acoustical treatment of ceilings, side walls, and enclosures. Isometric drawings show panels of perforated metal and sound-absorbent blankets supported by aluminum-grid ceiling system or fixed to wall with metal-molding caps and spring clips. Illustrates variety of three-dimensional patterns that strengthen sheet material and suggest exciting design possibilities. Diamond Mfg. Co., Wyoming, Pa.

634. Foamglas Insulation, AIA 37-B, 24-p. booklet containing data on latest recommended procedures for application of all-glass cellular insulation to roofs, curtain walls, core walls, and concrete ceilings. Also shows methods of perimeter insulation. Provides typical details and photos taken during installation. Separate section describes primers, adhesives, and finishes to be used in application. Technical data on heat transmission values is tabulated in chart form. Pittsburgh Corning Corp., One Gateway Center, Pittsburgh 22, Pa.

635. Styrofoam Insulation, AIA 37-B, 16-p. folder enclosing separate detail sheets which illustrate variety of applications for polystyrene, plastic-foam insulation. Clearly drawn details show rigid-type material used to insulate wood and metal windows, masonry-wall door opening, perimeter heating ducts, slabs and foundation walls. Also includes listing of thermal, physical, and water-resistant properties; specification sheet; ordering data. The Dow Chemical Co., Midland, Mich.

634. Glass-Fiber Insulation, (WHN-11), 4-p. brochure featuring lightweight glass-fiber blanket, faced on one side with reflective aluminum foil, for home insulation. Lists advantages in cost and comfort; provides thermal resistance factors and packaging data for three available thicknesses; shows installation in ceiling and wall. L.O.F. Glass Fibers Co., 1810 Madison Ave., Toledo 1, Ohio.

(Continued on page 194)



Strength, Color and Workability of Atlas Mortar are features that pleased Contractor L. A. Swyer of Albany, N. Y., on Dormitory Building job (above) at Rensselaer Polytechnical Inst., Troy, N. Y. Clean, modern design is work of Architect Henry L. Blatner, Albany.

For enduring beauty on your next project be sure to specify ATLAS* MORTAR Cement

- Durable, weather-resistant joints for all types of masonry begin with good workability in the mortar.
- With Atlas Mortar you get a smooth, workable mix and weatherproof joints that resist freezing-thawing weather.
- Atlas Mortar is quality-controlled during manufacture to insure uniform performance on the job. (Complies with ASTM and Federal Specifications.)

For further information, write Universal Atlas, 100 Park Avenue, New York 17, N. Y.

UNIVERSAL ATLAS CEMENTS

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*"ATLAS" MORTAR CEMENT is the registered trademark of the masonry cement manufactured by the Universal Atlas Cement Company

M-62

UNIVERSAL ATLAS CEMENT COMPANY—member of the industrial family that serves the nation—**UNITED STATES STEEL**

OFFICES: *Albany • Birmingham • Boston • Chicago • Dayton • Kansas City • Milwaukee • Minneapolis • New York • Philadelphia • Pittsburgh • St. Louis • Waco*

p/a manufacturers' literature

(Continued from page 188)

637. Kilnoise Acoustical Tiles, AIA 39-B, 4-p. data sheet presenting 12" sq mineral acoustical tiles with capillary structure free from fissures and holes. Describes installation via mechanical suspension and adhesive application. Photos show installations in public buildings. Illustrates color and striated tile developed for decorating variety. Technical data; specifications. New England Lime Co., Adams, Mass.

specialized equipment

843. Dishwashers and Disposalls, E-504-Cl, 12-p. booklet providing typical plumbing and electrical dimensions for dishwashers and food-waste disposers of various sizes. Diagrams suggest locations for necesary wall and floor connections; typical installation with or without water flow switch. Also covers drain system, septic tank, and catch-basin setups. Hotpoint Co., 5600 West Taylor St., Chicago 44, Ill.

844. Lev-Elasto Dampers, 2-p. data sheet on vibration and sound absorbing machinery mounts with nonskid top plate, which may be installed without fastening or secured by bolts or cement bond; internal bolt adjustment permits leveling up to ¾". Describes several damper types and shows three installation arrangements. Details; tables of dimensions, load capacities. The Korfund Co., Inc., 48-15 32 Place, Long Island City 1, N. Y.

845. Mills Toilet Compartments, AIA 35-H-6, 20-p. catalog exhibiting line of junior-height toilet enclosures, hospital cubicles, and shower units for institutional use. Provides color illustrations, complete details, and specifications for ceiling hung, floor-braced, or overhead-braced compartments. Photos show standard hardware and accessories. Drawings suggest layouts for compartment groups. In addition, explains how finishes are applied; sample chart shows 20 standard colors available in porcelain or baked-on enamel finish. Mills Metal Compartment Co., 965 Wayside Rd., Cleveland, Ohio.

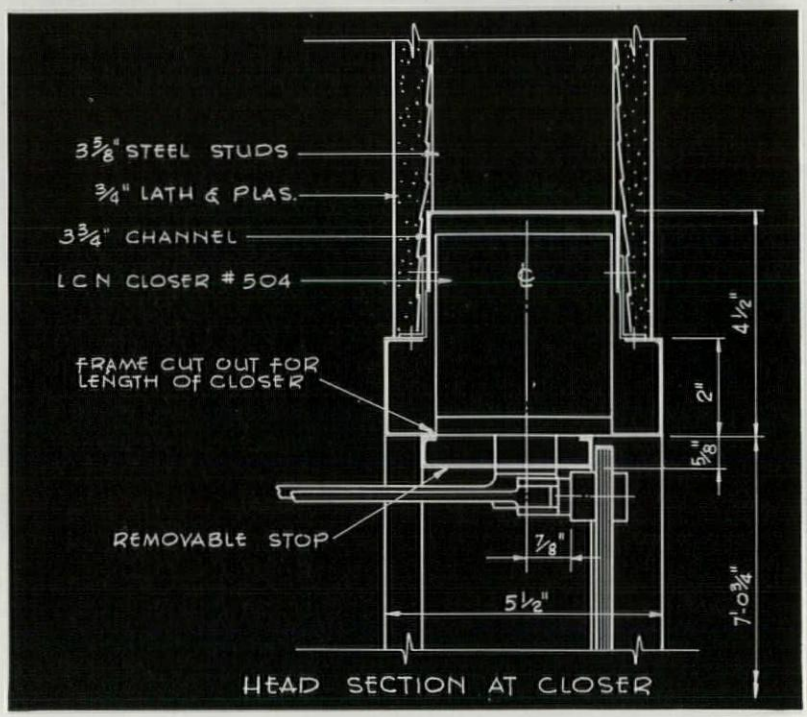
846. Soiltest Apparatus, 12-p. catalog describing and illustrating large array of engineering test equipment for soils, concrete, asphalt, and construction materials. Items ranging from mixing pans to compression machines are included in appropriate section. Suggests laboratory layouts with equipment and specifications. Price list; index. Soiltest Inc., 4711 W. North Ave., Chicago 39, Ill.

847. Car-Mon Exhaust Systems, 8-p. bulletin featuring equipment for carbon monoxide exhaust systems, designed to protect garage employes from dangerous fumes. Discusses both underground and overhead types for concealed or exposed installation. Shows flexible suction tubes, outlets, fans, and miscellaneous parts. Diagrams; table of dimensions. Car-Mon Products Co., 4554 N. Broadway, Chicago 40, Ill.

848. Vizusell Merchandising System, AIA-23c/Da, 40-p. catalog of adjustable metal hardware and instruction for erecting complete modular merchandising display system. Combination photo-diagrams show how basic equipment is adapted for overcounter, floor, and wall displays. Illustrates components: upright channels, special brackets, snap-on attachments, panels, and glass bins. In addition, double-faced gondolas with adjustable perforated shelves for clip-on binning. L. A. Darling Co., Bronson, Mich.

interior furnishings

64. A New Way of Life in the Office (AF-116), 16-p. pamphlet showing flexibility of office layout possible with modular furnishings and partitions. Shows how desk sections combine to form efficient working areas; pictures wood and steel intermediate-height partitions. Describes construction of units; gives suggested office layouts. Arnot-Jamestown Div., Aetna Steel Products Corp., 730 Fifth Ave., New York 19, N. Y.



CONSTRUCTION DETAILS

for LCN Overhead Concealed Door Closer Installation Shown on Opposite Page

The LCN Series 500 Closer's Main Points:

1. Efficient, full rack-and-pinion, two-speed control of the door
2. Mechanism entirely concealed; arm visible on inside of an out-swinging door
3. Hydraulic back-check prevents door's being thrown open violently to damage door, walls, etc.
4. Double lever arm provides maximum power to overcome wind and drafts
5. Arm may be hold-open type, 90° to 140° or 140° to 180°

Complete Catalog on Request—No Obligation
or See Sweet's 1957, Sec. 18e/La

LCN CLOSERS, INC., PRINCETON, ILLINOIS

MODERN DOOR CONTROL BY *LCN* ·CLOSER CONCEALED IN HEAD FRAME

NATIONAL HOUSING CENTER, WASHINGTON, DISTRICT OF COLUMBIA

LCN CLOSERS, INC., PRINCETON, ILLINOIS

Construction Details on Opposite Page



Aubinoe, Edwards & Beery, *Architects*



erase this shadow from his future

with **GUTH LIGHTING**

What gift could be of greater value to students than *lighting that protects their normal vision?*

Their ability to see . . . to learn quickly and prepare for the future . . . their posture, health and happiness all depend greatly on proper classroom lighting.

Act now! Keep their future bright with sight-saving GUTH LIGHTING . . . developed especially for classrooms through more than a half-century of lighting experience.

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Guth

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994



All support elements (above) *are provided by single, self-sufficient wood units, made of glued-laminated Southern Pine. Each structural section is fabricated in two parts—two units forming arch to carry roof and wall loads; third unit is beam, to carry floor load, fitted in brackets about 2' above base of arch. When bolted, units form single section. Southern Pine Assn., P.O. Box 1170, New Orleans 4, La.*

New Beauty-Line window series consists of fixed upper sash and awning style lower sash in narrow wood frame (below). *Features slim lines, complete factory assembly and packaging, and low per-sq-ft cost. Narrow meeting rail serves both as lower rail of window's fixed sash and receiving jamb for the operating sash. Five sizes available in three heights and two widths. Anderson Corp., Bayport, Minn.*

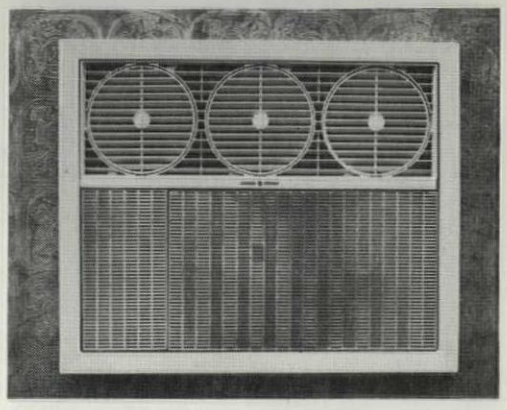


Steel members and flooring to be protected against fire and corrosion can be sprayed with a coating of pure asbestos fibers combined with an organic hydraulic-setting bonding material (below). *Steel columns coated directly with 2" thickness were rated at three hours; exposed ceiling coated with 1¼" layer, four hours; supporting ceiling beam encased with metal lath and 1½" sprayed Limpet, four hours —according to Underwriters' Laboratories tests. Keasbey & Mattison Co., Ambler, Pa.*



Built-in Thinline room air conditioner (below) *which needs no ducts, pipes, nor wasted floor space, circulates, filters, cools, ventilates, dehumidifies, and exhausts. Specifications: ½ hp, 115-v, 800-w, 5500 Btu/hr; ¾ hp, 115-230-v, 1150-w, 7700 Btu/hr; 1 hp, 230-v, 1480-w, 10,100 Btu/hr; dimensions: 25⅞" wide, 21½" high, and 17 7/16" deep. General Electric Co., Louisville 1, Ky.*





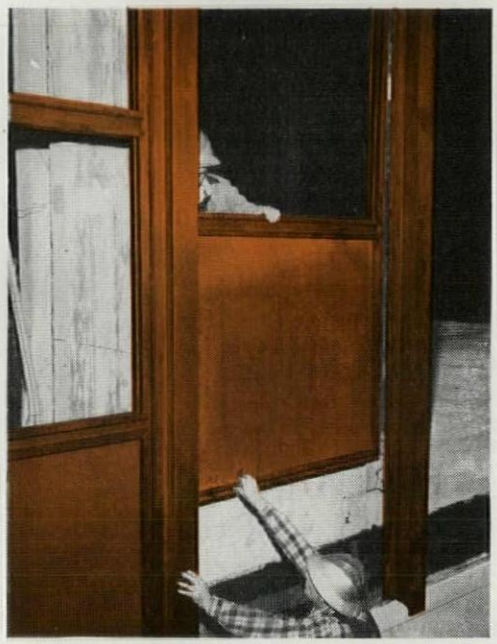
air and temperature control

Bathroom Ventilator: ceiling-mounted bathroom ventilator eliminates alignment problems with new compact design permitting flush installation between 6" deep joists. Square housing is nailed directly to side of joist while adjustable support bracket spans space to next joist. Power-supply connection, motor-blower unit, and decorative grill are designed for simple assembly with screws, wing nuts, and knobs. Access for cleaning gained by removing grill. Rubber-mounted oversize motor delivers 100 cfm of air. Unit is 5" high. Fasco Industries, Inc., Rochester, N. Y.

Fiber Duct: greater economies in initial outlay and installation cost for warm-air heating systems are achieved with new asphalt-impregnated, glue-laminated fiber ducts. Lightweight ducts, designed for installation in concrete-slab floors, are lined with aluminum foil, easily cut, and joined by standard connections. Full-length ducts available in diameters ranging from 4" to 8", are claimed to be capable of supporting over 200 lb per lineal ft. International

(Continued on page 200)

This is the house that

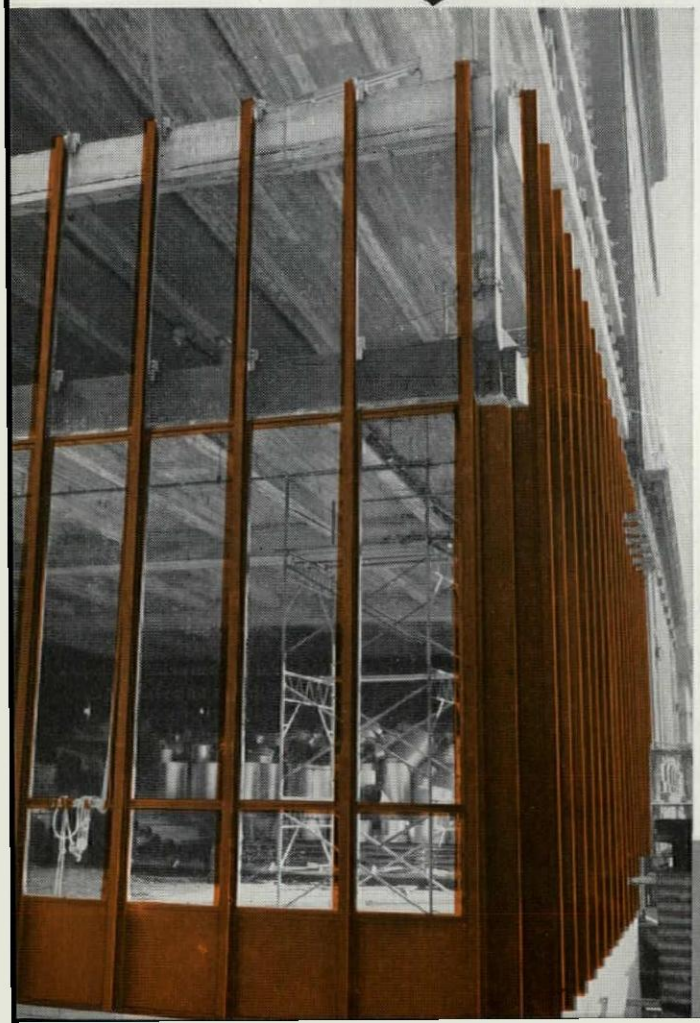


LOWERING ONE OF THE BRONZE PANELS into place. Panels using Revere architectural bronze sheet for spandrels were prefabricated by GENERAL BRONZE CORPORATION and delivered at the site ready for slipping into place. Panels are 4'7" wide by one-story high.

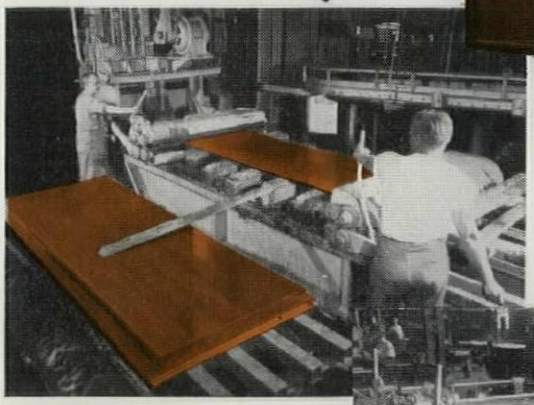
SHOWING ONE OF THE 4,554 PANELS each containing a spandrel sheet of Revere Architectural Bronze, weighing a total of 325,000 lbs.

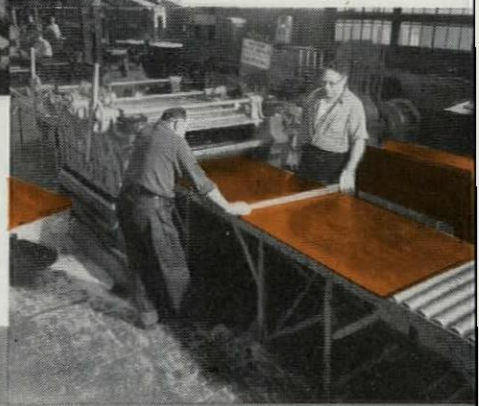


SECTION SHOWING FIRST-FLOOR PANELS in place and mullions ready to take additional panels on floor above. GEORGE A. FULLER CO. is the general contractor. Revere Extruded Architectural Bronze in 3 different shapes is used for the muntins and jambs, while Revere Architectural Bronze Sheets are used for spandrels in the panels and the louvers in the air conditioning cooling tower.

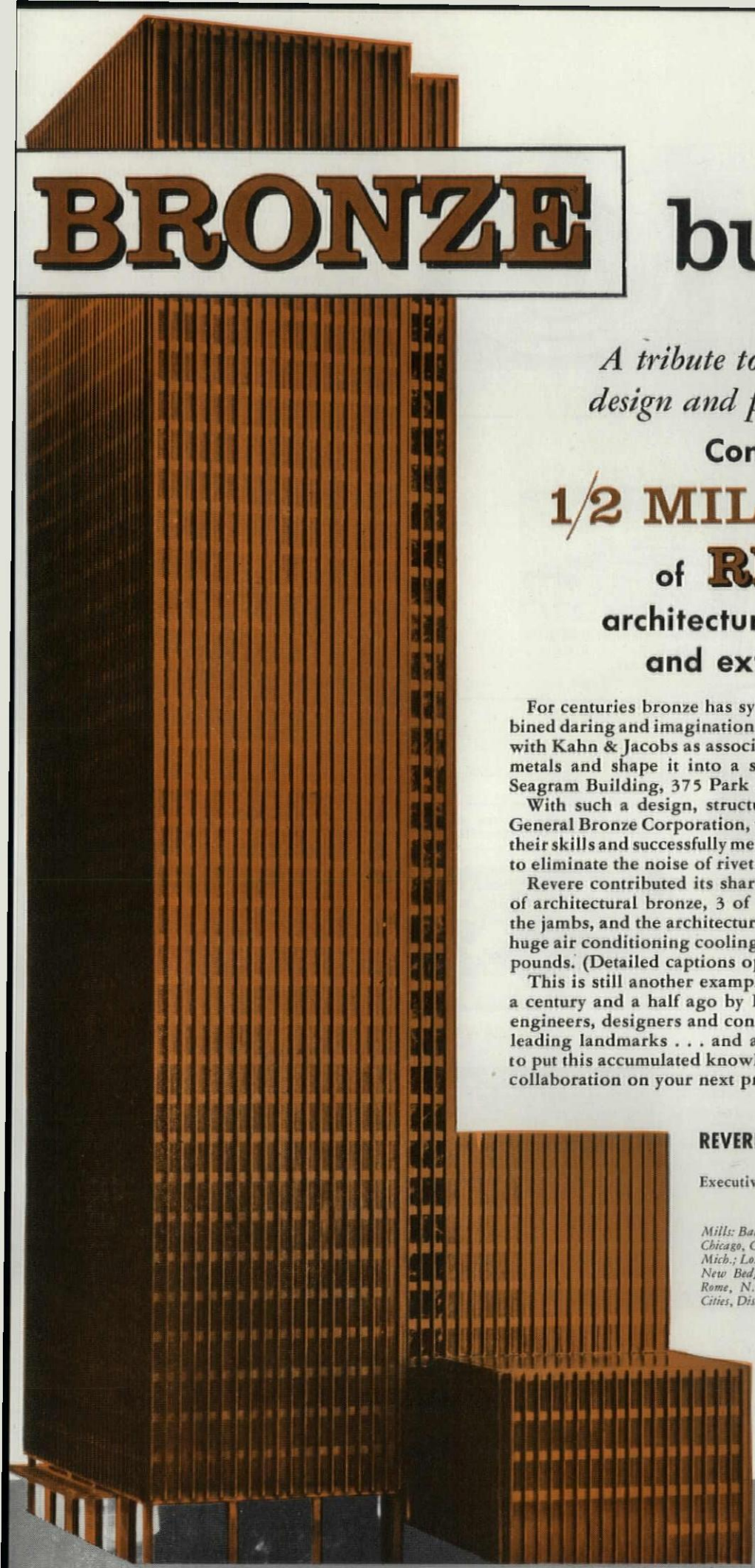


NO ROOM FOR ERROR HERE — Directly below you see the spandrel sheets being stretched at Revere's New Bedford plant prior to being shipped to GENERAL BRONZE CORP.





HERE YOU SEE — Revere Spandrel Sheets being tested for flatness. Great care had to be exercised by Revere workmen in order to make certain each sheet was absolutely flat throughout its length and width and that all corners were square.



BRONZE built

A tribute to modern structural design and production ingenuity

Contains over

1/2 MILLION LBS.

of REVERE

architectural bronze sheets and extruded shapes

For centuries bronze has symbolized endurance. But it took the combined daring and imagination of Mies van der Rohe and Philip Johnson, with Kahn & Jacobs as associate architects, to take this most ancient of metals and shape it into a striking, modern, 38-story landmark . . . Seagram Building, 375 Park Avenue, N. Y. C.

With such a design, structural problems were bound to occur. But General Bronze Corporation, working with various suppliers, combined their skills and successfully met those challenges. Bolting the steel girders to eliminate the noise of riveting, for example, was a major innovation.

Revere contributed its share by furnishing all of the spandrel sheets of architectural bronze, 3 of the extruded shapes for the muntins and the jambs, and the architectural bronze sheet for the louvers used in the huge air conditioning cooling tower, a total of more than a half-million pounds. (Detailed captions opposite page.)

This is still another example of how Revere, since its founding over a century and a half ago by Paul Revere, has worked with architects, engineers, designers and contractors in creating many of the country's leading landmarks . . . and another good reason why it will pay you to put this accumulated knowledge to work for you by seeking Revere's collaboration on your next project.

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COPPER * BRASS 18 01 * REVERE * ALUMINUM

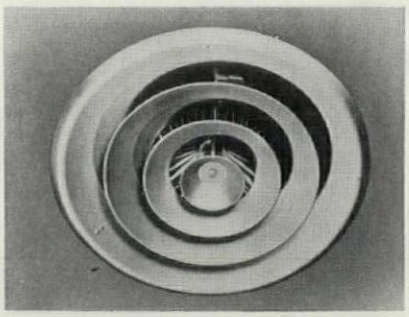
Manufacturers of Revere Sheet, Roll and Strip Copper for roofs, gutters, downspouts and flashing . . . Revere Architectural Bronze extruded shapes and sheets for spandrels, muntins, mullions, jambs, louvers and decorative purposes . . . Revere Copper Water Tube for hot and cold water lines, plumbing lines, vent, waste and drainage lines, underground service and processing lines, radiant panel heating, air conditioning lines, and oil burner lines.

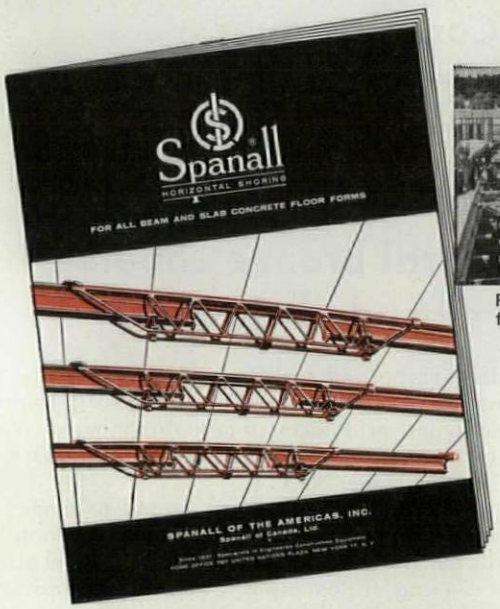
p/a products

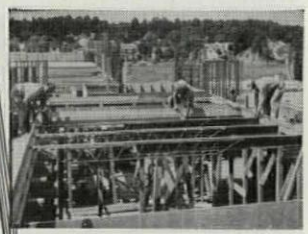
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Oil Burner Co., Fibre Duct Div., 3800 Park Ave., St. Louis 10, Mo.

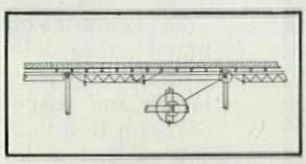
Ceiling Diffuser: new ceiling air diffuser (*right*) offering advantages of center induction and radial distribution, operates on principle of 100 percent aspiration. By discharging air outward along ceiling in layers and drawing room air in through center, unit creates uniform air flow throughout room. Diffuser is available in four sizes. Anemostat Corp. of America, New York, N. Y.



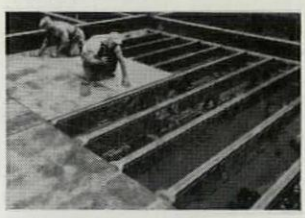




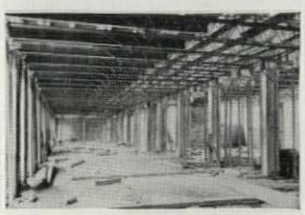
Page 6. Spanall installs fast and easy.



Page 5. Spanall applies to any type of poured concrete construction.



Page 7. Plywood decking laid directly on Spanall.



Page 2. Spanall replaces vertical shoring, frees work areas below forms.

Newest Catalog

features new way to save time, cut costs

Here is practical, profitable information about Spanall, the popular, new, all-metal Horizontal Shoring for concrete forms. Photos, charts and drawings clearly illustrate how Spanall is erected, stripped and stored—with new ease and speed... how Spanall adjusts quickly to any required span length—how Spanall forever eliminates cumbersome, costly vertical shoring...and actually saves as much as 40% in both time and money.

Get *all* the facts about Spanall—it could provide just the competitive advantage you'll need for 1957.

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Gentlemen—Please send, without cost or obligation, _____ copies of the new Spanall Catalog.

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construction

Long-Length Gutter: new long-length galvanized-steel roof gutter is claimed to cut installation costs in half by eliminating most of measuring, cutting, and soldering required for installation of conventional 10-ft sections. In addition to standard 20-, 25-, 30-, and 32-ft sections, gutters may be ordered in custom lengths. Republic Steel Corp., Berger Div., Canton, Ohio.

Permagile: newly developed epoxy-based industrial poly-plastic alloy is said to be capable of welding concrete, brick, cement, and other masonry products with stronger bond than joined material itself. Permanently waterproof, chemical-resistant, nonshrinking, nonexpanding material is particularly suitable for restoration of complete concrete buildings, sewers, and other major repair jobs as well as industrial waterproofing, overhead tile setting, and restorations of architectural detail. Special formulations are available for joining, filling, or cladding. Permagile Corp. of America, 37-23 33rd St., Long Island City 1, N. Y.

Aluminum Foil: recent applications give aluminum foil new status among building materials. Aluminum-foil honeycomb sandwiched between aluminum sheets forms rigid, lightweight, moisture-, fire-, and rotproof panels for building floors, walls, and ceilings. Used in place of plate-type fins for cooling coils, aluminum foil reduces size and weight of air-conditioning units, resulting in greater economy. Porcelain-enamel coated aluminum foil, supplied in continuous rolls, can be used on any surface suitable for lamination. Coating will not crack or chip, can be drilled, nailed, or cut and is available in matte or glossy finishes. Alcoa, Pittsburgh 19, Pa.

Masonry Furring Clips: steel clips for fastening expanded metal lath to any masonry wall dispense with use of bolts, nails, wires, or ties. After wall is dampproofed, metal lath is stretched across clips which are installed between horizontal joints of wall during erection. Twin tynes projecting from body of clip are simply bent up to lock lath in place. Decor Metal Specialties, P.O. Box 3, Severna Park, Md.

Kenna-pak Wardrobe Header: prefabricated header assembly for wardrobes using ¾" and 1⅜" sliding doors, standardizes door openings, eliminates fascia, and dispenses with door cutting. Header is nailed to side jambs through pre-pierced holes in header plate extensions; then unit is raised into position and nailed directly to studs of rough opening. Packaged set consists of adjustable steel-header-plate with wood nailing strips, aluminum track, interchangeable hangers, and nylon guides; assemblies are available for openings from 48" to 96" with two, three, or four sliding doors. Kennatrack Corp., Elkhart, Ind.

doors and windows

Adjustable Threshold: new adjustable

(Continued on page 204)

How to simplify and cut costs of Your wall construction with

BAYLEY

CURTAIN WALL SYSTEMS



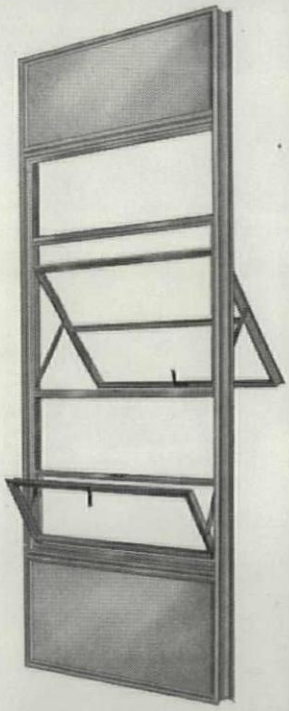
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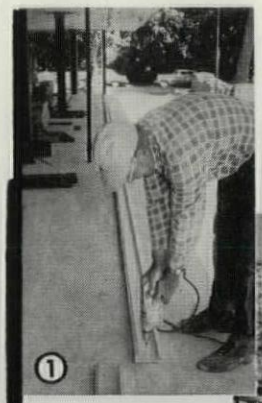
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1. Bolting sill and header plate into position.
2. Bolting jamb plate to load-bearing column.



3. Interlocking window-panel into position.







4. Caulking interlock grooves before positioning mullion.
5. Positioning Bayley adjustable-width mullion.
6. Positioning window-panel — using interlock groove as slide.



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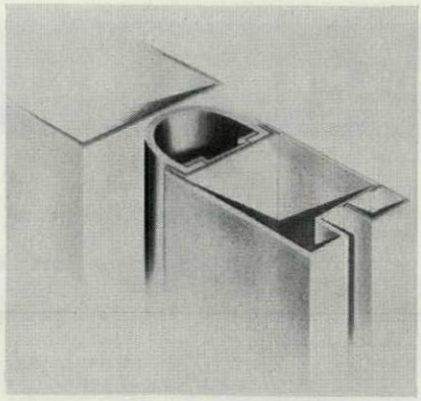
p/a products

(Continued from page 200)

aluminum threshold with two interlocking members is designed for use where floors of different levels must be joined. Versatile threshold accommodates offset floors from ¼" to 1", is suitable for in- or outswinging doors, and eliminates grouting or special curbs. Double lip receives weatherstrip hooks. Threshold, furnished in any length with over-all width of 5¼" to 5½", can be drilled and countersunk, highly polished or mill finished. Brick Muller & Associates, Falls Bldg., Memphis, Tenn.

special equipment

Swivlstool: double swivel-action stool, mounted to wood or concrete floor affords extreme mobility to seated draftsman or machine operator. Aluminum stool describes full 5-ft diameter circle, rides up and down, and can be swung out of sight under bench. Stool comes equipped with upholstered 2" foam-rubber seat; backrest is optional. Recommended for snack bars, kitchen work areas, laboratories, and offices. A & A Mfg. Co., Warsaw, Ind.



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Dark-O-Matic Window Shade: new electrically operated steel-framed lightproof window shade assembly is designed for use in dark rooms, rooms for visual education, auditoriums, or chapels. Said to be in low cost range, motorized shades operate by means of self-contained unit which houses motor, gear box, limit switches, and terminals. Operator is controlled by remote control station with up, down, and stop positions, or by lever-action pull switch. Mechanism will operate single shades up to 8 ft wide or 56 sq ft in area. Ray Proof Corp., 513 W. 54 St., New York 19, N. Y.

surfacing materials

Korok Steel Chalkboard: high-quality steel chalkboard fastened directly to wall, eliminates costs of lamination, core, backing, and plaster grounds. Chalkboard is firmly bonded to plaster or masonry walls with special adhesive which is claimed to resist up to 300 psi shear pull. Board itself is composed of heavy-gage sheet steel to which green vitrified enamel is fused; inconspicuous butt seams provide smooth, continuous writing surface. The Enamel Products Co., 341 Eddy Road, Cleveland 8, Ohio.

Vicrtex "Continental" & "Translusion" Patterns: unusual design process gives smooth-surface vinyl fabrics illusionary depth and glowing luminosity. Patterns embossed on surface of fabric are composed of tiny precision "mirrors" which create contrasts in light and shadow. First new design provides heavily quilted effect; second design reflects light in continually flickering nuances. Fabric material is water-, chip-, crack-, peel-, and scratch-proof, flame-, stain-, and soil-resistant. E. Carpenter & Co., Inc., Empire State Bldg., New York 1, N. Y.

An announcement of interest to architects, builders and specifiers

KENTILE, INC., to re-name all of its floor tile products

To conform with established architectural practice in specification writing, and for quicker and simpler identification, the names of all Kentile, Inc., floor tiles will now carry the Kentile name plus the material description as follows:

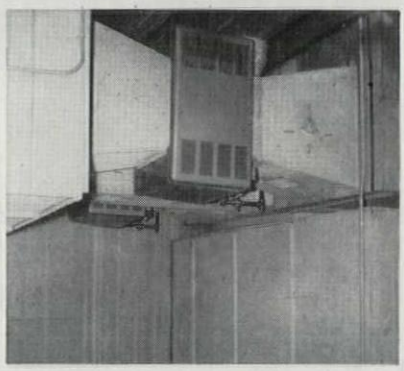
FORMER NAME	NEW NAME
KENTILE	KENTILE asphalt tile
KENRUBBER	KENTILE rubber tile
KENCORK	KENTILE cork tile
KENFLEX	KENTILE vinyl asbestos tile
KENROYAL	KENTILE solid vinyl tile
KENFLOR	KENTILE cushion-back vinyl tile

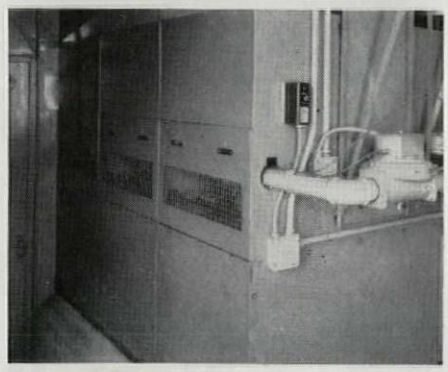
Effective in March, all Kentile, Inc., national advertising will feature these new names.

We at Kentile hope that this simplification will prove to be of assistance to you in selecting the proper flooring in your future specifications.

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Unusual quietness in operation wins praise from pastor and congregation for this Janitrol gas-fired central system. Six Janitrol BDC Heavy Duty Gas-Fired Heaters provide 1½ million Btu/hr. input. System is compact, easily accessible, and economical.

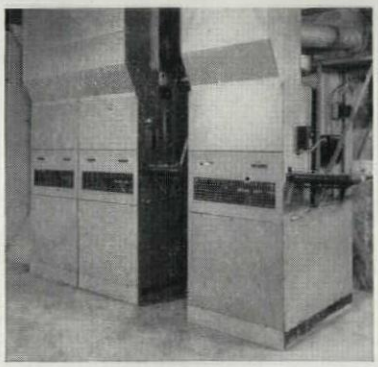
When you are specifying heating or cooling equipment for needs peculiar to churches, it will pay you to know these facts.

Janitrol's complete line of equipment for new construction and modernization includes units for virtually every church heating and cooling requirement . . . with unusual flexibility of installation. Whether the job calls for a compact central system, multiple

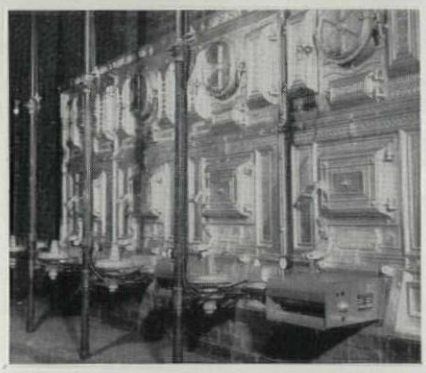
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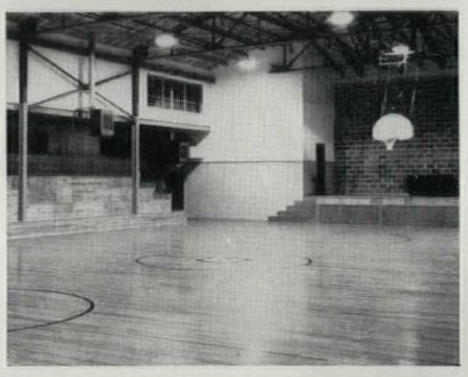
Building and Modernization Heating and Air Conditioning



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books received

Tower in the West. Frank Norris. Harper & Brothers, 49 E. 33 St., New York, N. Y., 1957. 362 pp., $3.95

Cabinet Making and Millwork. Alf Dahl and J. Douglas Wilson. American Technical Society, 848 E. 58 St., Chicago, Ill., 1956. 352 pp., illus., $6.50

New German Architecture. Selected by Gerd Hatje, Hubert Hoffmann, Karl Kaspar. Frederick A. Praeger, Inc., 150 E. 52 St., New York 22, N. Y., 1956. 220 pp., illus., $11.50

Mortgage Lending. Willis R. Bryant. McGraw-Hill Book Co., Inc., 330 W. 42 St., New York, N. Y. 1956. 375 pp., $6.75



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clarity and assurance

Max Bill. *Tomás Maldonado. Nueva Visión S.R.L., Cerrito 1371, Buenos Aires, Argentina, 1955. Distributed in U.S. by Wittenborn and Company, 38 E. 57 St., New York 22, N. Y. 148 pp., illus., $7*

Max Bill is best known to us over here by his geometric-abstract sculpture in metal or plaster. It has the qualities we associate with Swiss taste in architectural, industrial, or typographic design: legible, neutral, and sober. Not stripped and unfriendly, but never encumbered with the superfluous: an expression of confidence in the continuing state of things. At times, Bill's work recalls Hans Arp's fluid quality, but is altogether without human figuration or suggestions of the human body. The clarity, assurance, and good looks of his work recall that of José de Rivera in this country. Bill is now Head of the Architecture Department and Rector of the new School of Design at Ulm, Germany—that interesting venture which has sought to rekindle the torch of the Bauhaus, where Bill received part of his training. Through his position as an educator, by the obvious integrity of his work, and by his abundant vigor (388 items on, by, or concerning Max Bill are listed in the bibliography), he is undoubtedly one of the strongest, most consistent personalities in European design thought today.

Maldonado's monograph is, in the first place, a fine photographic survey of Bill's activity, not only in sculpture, but also in his other fields of endeavor, from painting and exhibitions to the design of the new school at Ulm. It is prefaced by a worthwhile editorial on a by-now-old problem that is evidently still debated: the final outcome of abstract art and design, especially the question of creating a "style beyond all styles"—an approach that would be timeless and universal. Also included are a couple of short essays by Bill, of which the best is, "The Mathematical Approach to Contemporary Art."

(Continued on page 212)

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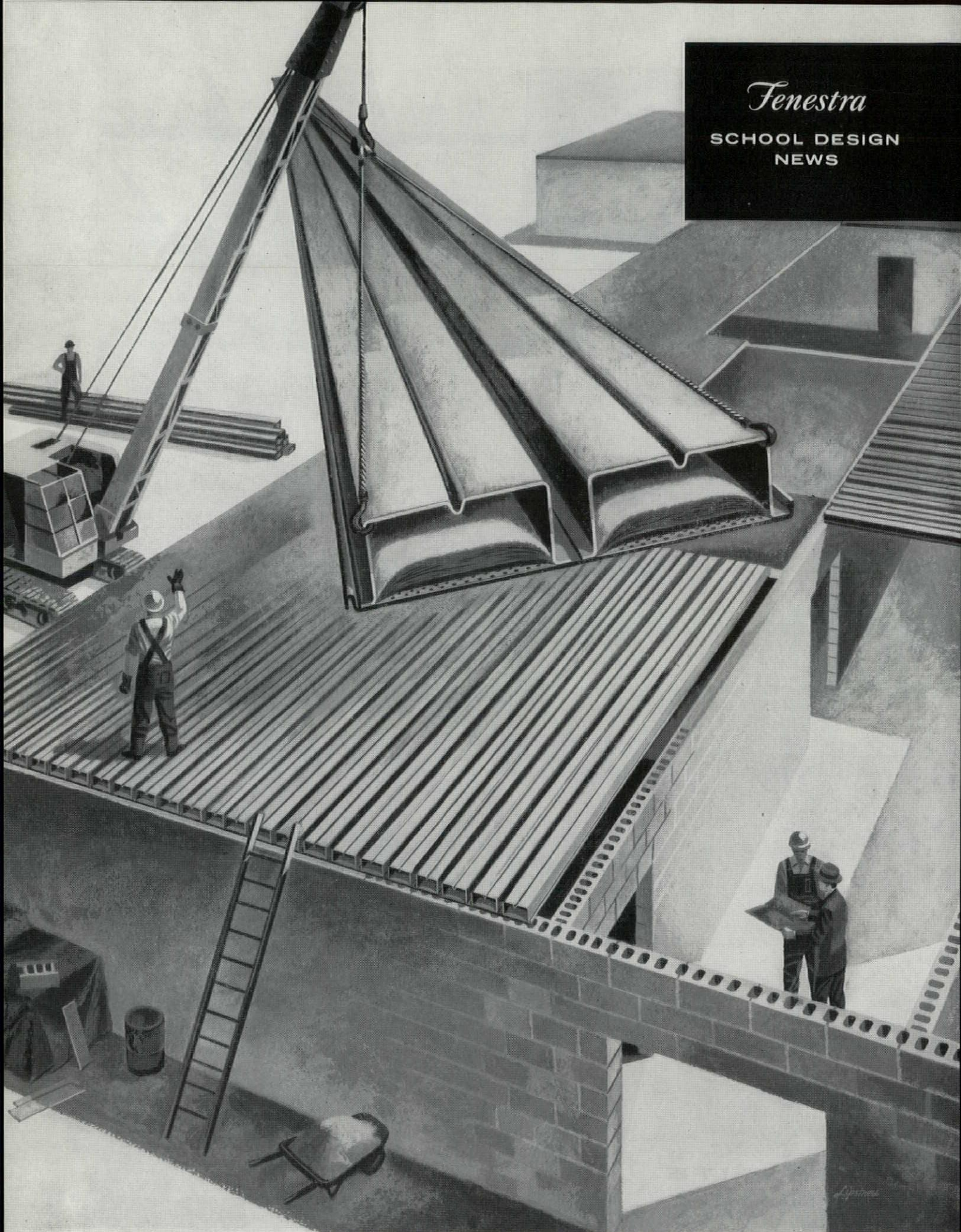
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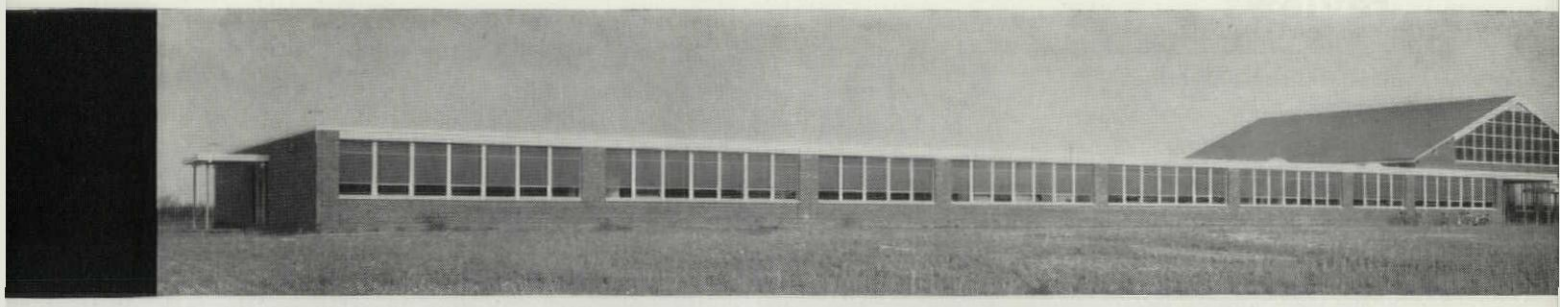
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Fenestra
SCHOOL DESIGN
NEWS



Fowlerville High School, Fowlerville, Michigan, is designed with interior load-bearing masonry walls and Fenestra Acoustical-Structural "D" Panels to reduce structural steel requirements to a minimum. Total costs for this 41,000 square foot school were approximately $11.00 per square foot . . . an economical figure for high school construction in this area.

Architect: Louis C. Kingscott and Associates, Inc., Kalamazoo, Michigan.

Contractor: Vandenburg Construction Co., East Lansing, Michigan.

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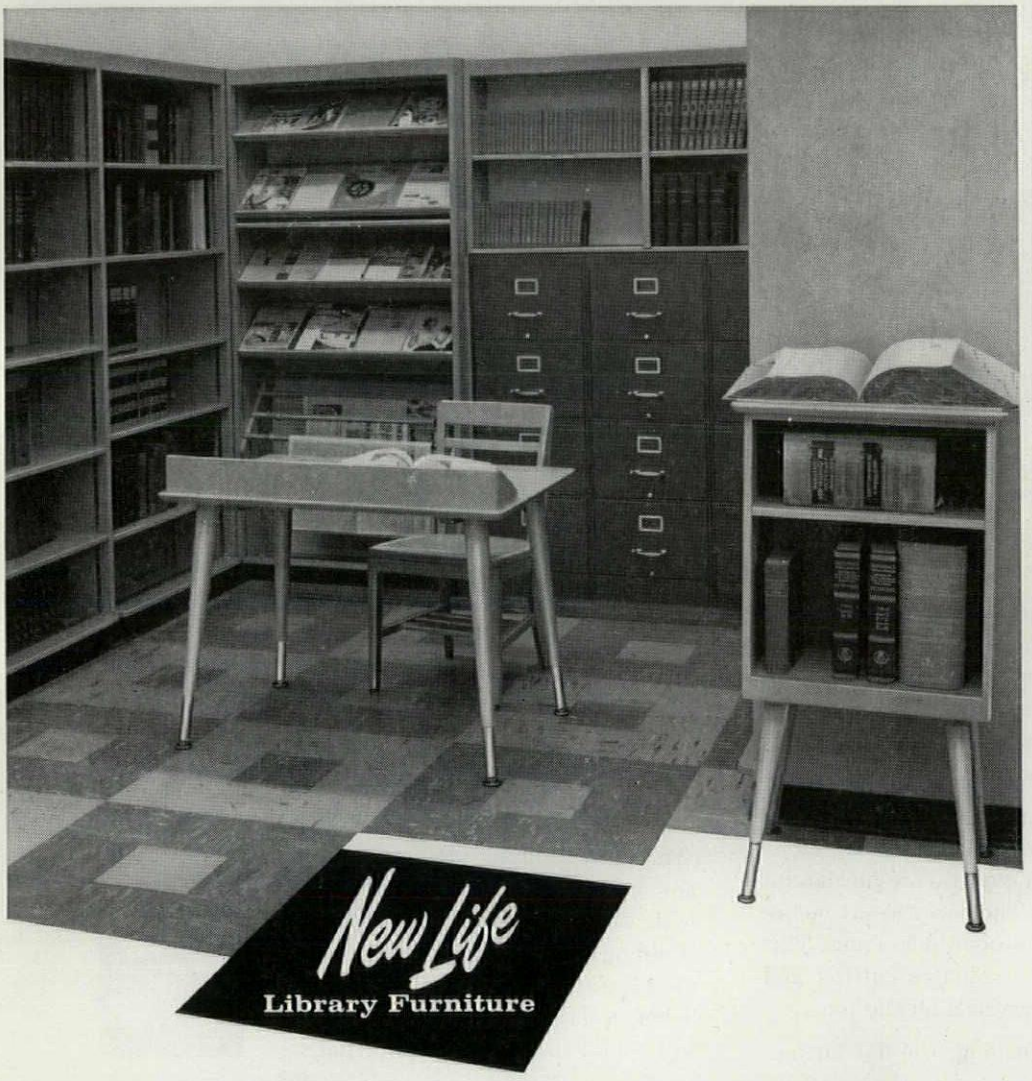
CITY_____ STATE_____

(Continued from page 208)

Clearly, Bill is far removed from the "dumb" (i.e., mute) artist who claims to be the unintellectual, purely intuitive creator—like the Douanier Rousseau, says Maldonado, painting at the dictation of his dead wife. Bill, on the contrary, is systematically, consciously vocal in a number of ways, all of which he sees as bound in a common aim, that of bringing coherence and order to life. From the many other artists who subscribe to this aim, Bill differs by the degree to which he sees new and emergent *varieties* of order appearing as mankind delves further into the mysteries of the cosmos. His choice of the words "good form" as a slogan is not without its meaning. "Good form," in contrast to "good design," expresses belief in something more absolute and more universal than the individual object at hand. It has connotations of Greek simplicity, and recalls, as often do his designs (particularly of furniture) the Greek notion of "justice": that which owes its "rightness" and everlasting superiority to its supreme qualification for the task. With this ideal one associates the "well-wrought" weapons, the "polished" tables in the homes of the Odyssey's heroes.

Born in 1908, and therefore belonging to the second abstract generation, Bill was influenced by what was perhaps the strongest source of abstract ideology in the late 1920's, the *De Stijl* movement; he later joined and to some extent pioneered the divergent trend known as "concrete" art. *De Stijl*, in its classical phase (to which Mondrian remained faithful) assumed that art made visible the basic relationships, such as the horizontal-vertical relationship, that are dimly but unmistakably present in nature, but have to be abstracted from nature's flux and disorder by the human spirit. Man, acting through technology and art, brings these relations to such perfection as is given us humans to attain. Pure relationship, then, is known to be there waiting for the artist to *disclose*. According to Mondrian, who is insufficiently understood on this point, pure relationship has the unerring objectivity and consistency of mathematics of logic, but is discovered and shown in art by observation and intuition, by trial and error—not through any calculation or computation. When it was argued that this search for objective relationship would reduce art to a common sameness, Mondrian replied that intuition, the essence of creativity, would forever remain tied to the person; that an artist's subjectivity, his rhythm, dimensioning and weighing of color—the entire expressive side of art in fact—would always remain an important, indispensable aspect of creation. He conceded, perhaps in deference to his colleague Vantongerloo, that "constructive" and geometrical proced-

(Continued on page 216)



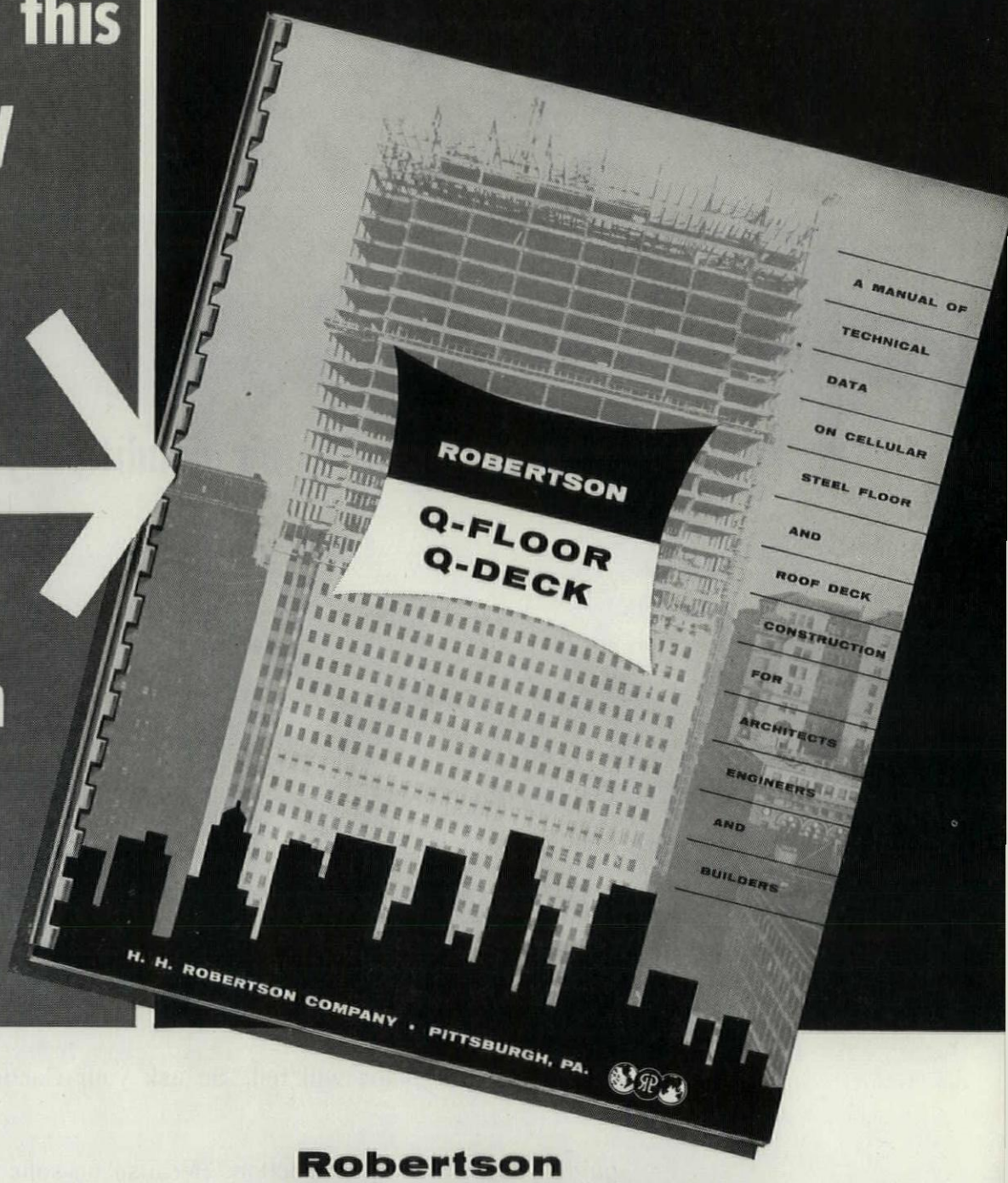
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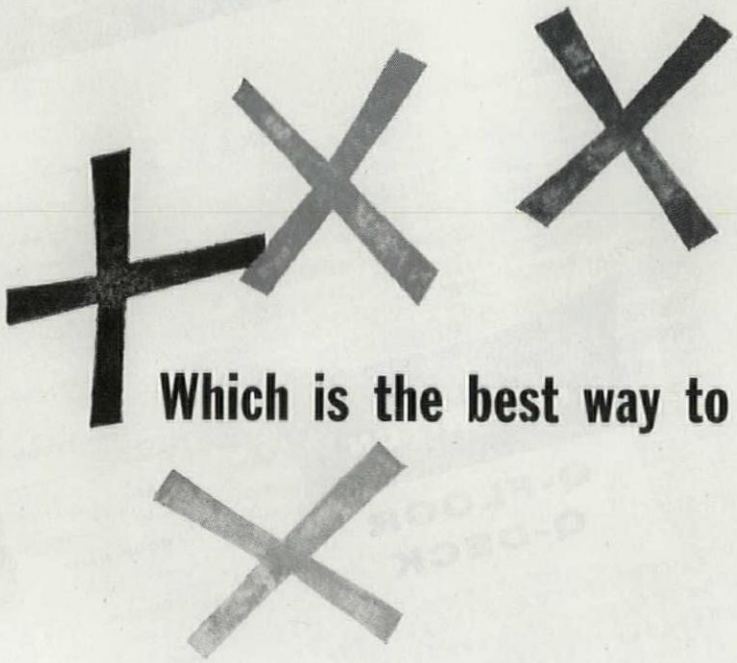
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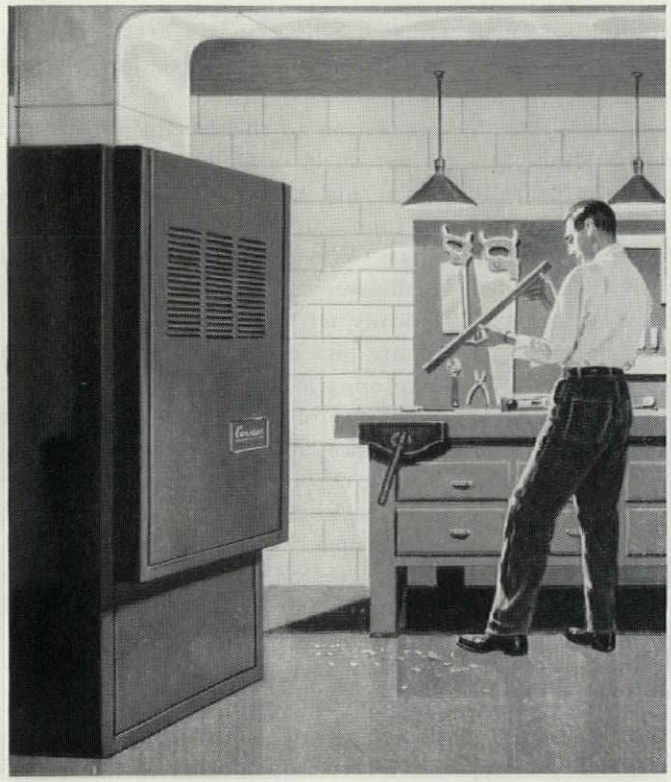


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That depends on the houses. The size, the type of architecture, the construction, and the climate can make big differences.

For example, take the air conditioners shown on the opposite page. One may be best for your houses, but which? Only a survey of your plans will tell. So ask your Carrier dealer to guide you in the right selection. Because he sells these four (and many more), his first interest is to recommend the type that serves you best. Call him today and be sure. **Carrier**

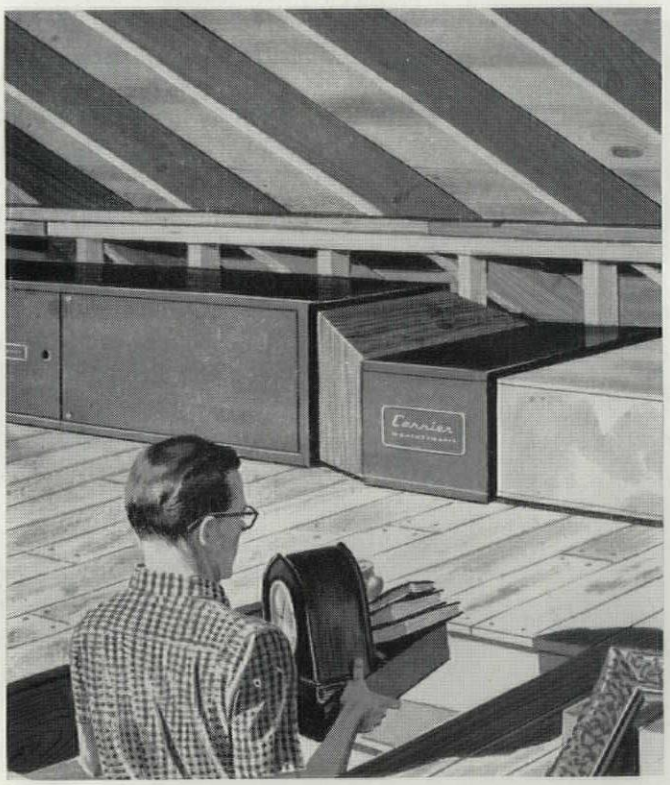
It's time to call Carrier. You'll find your Carrier dealer's name in the Classified Directory.
Carrier Corporation, Syracuse, New York; Toronto, Canada; International Division, New York, N.Y.



Do your homes have basements? This Carrier Year-round Weathermaker* provides heating and cooling from one compact unit. It also fits in closets or utility rooms. Uses gas or oil and can be water or air cooled. One control for heating and cooling.



Are your homes without basements? This combination of a Carrier downflow type Winter Weathermaker with a Summer Weathermaker underneath is perfect if you put your ducts in the slab or crawl space. Takes very little space in the house. Gas or oil fired.



Do you build small, compact houses? This horizontal Winter Weathermaker has a Summer Weathermaker alongside and supplies year-round air conditioning taking no space within the house. It fits in the attic or crawl space, needs no water.



Do you want to offer future air conditioning? This Carrier Winter Weathermaker has a cooling coil casing on top. A coil can be inserted in this casing for summer cooling without changes in the ducts. Your homes will have "the FURNACE with a FUTURE."

*Reg. U.S. Pat. Off.

(Continued from page 212)

ures did not necessarily weaken the work's vital rhythm, so long as the mathematical component was added more or less as an afterthought to intuition.

Of Vantongerloo, on the other hand, the story is told that he once seriously alarmed the designer of a bridge by assuring him that one man sounding the right note on a violin would cause the structure to vibrate harmonically and shatter like a glass. Vantongerloo's studio is crowded with sculptures of plastic and metal. They frequently recall mathematical models, and equations may form parts of their titles. When van Doesburg called for an art still more triumphant over nature, and demanded an art *in opposition* to what *De Stijl* in its first phase regarded as the fundamental relationships of the world—or at least in opposition to the Euclidean, up and down world in which we live—he rotated his rectangular compositions to the anti-architectural, oblique angle (as in the Café Aubette at Strasbourg, 1926) and broke ideologically with Mondrian. His notion of an "art concrete" came closer to Vantongerloo's position by putting a greater premium on "creation" in the sense of what is contrived, invented, devised by man, or at any rate wrested from man's immediate experience. With the admission of forms derived from beyond the ever receding horizon of science and mathematics, a whole range of expression seemed to open up; not only the old but hardly exploited world of analytical geometry, but also the more recently "created" world of non-Euclidian geometry, typology, atomic physics, etc. Though all these disciplines deal primarily with invisible relationships, with what Max Bill to this day refers to as "thought," this invisibility can be rendered *concrete* through graphs, constructions, or models in the form of doughnuts, pretzels, Moebius' strips, etc. What is more, from geometrically inspired curves it is but a step to the bio-morphic curve reminiscent of the human body, and capable of all sorts of Surrealist and Freudian-directed associations — as, for instance, in Arp's "Human Concretions," which seem to return to the equally unexplored inner world of man.

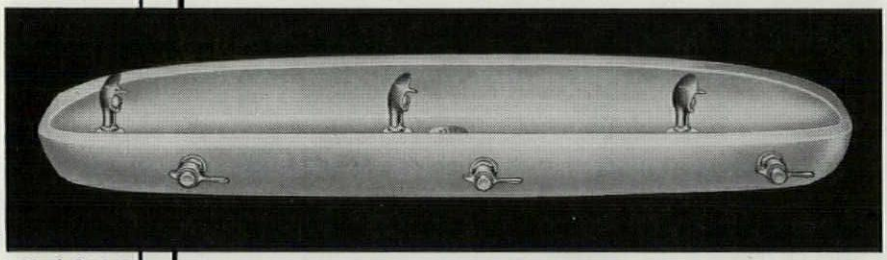
In the light of Concrete Art, then, we have to understand Bill's thematic developments done with the aid of compass, protractors, squared paper, and so on. Such means, he emphatically asserts, are not to be confused with "computed art." Constructive means, he insists, are used only to permit a form or theme to *develop*, to *grow* (he avoids the term "organic," however). It grows out of the structure and order of the universe, out of the manifold and complex *functions* which all form has in relation to our seeing, communica-

(Continued on page 218)



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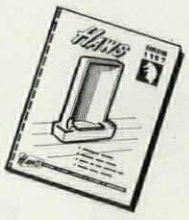
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Model 10Y

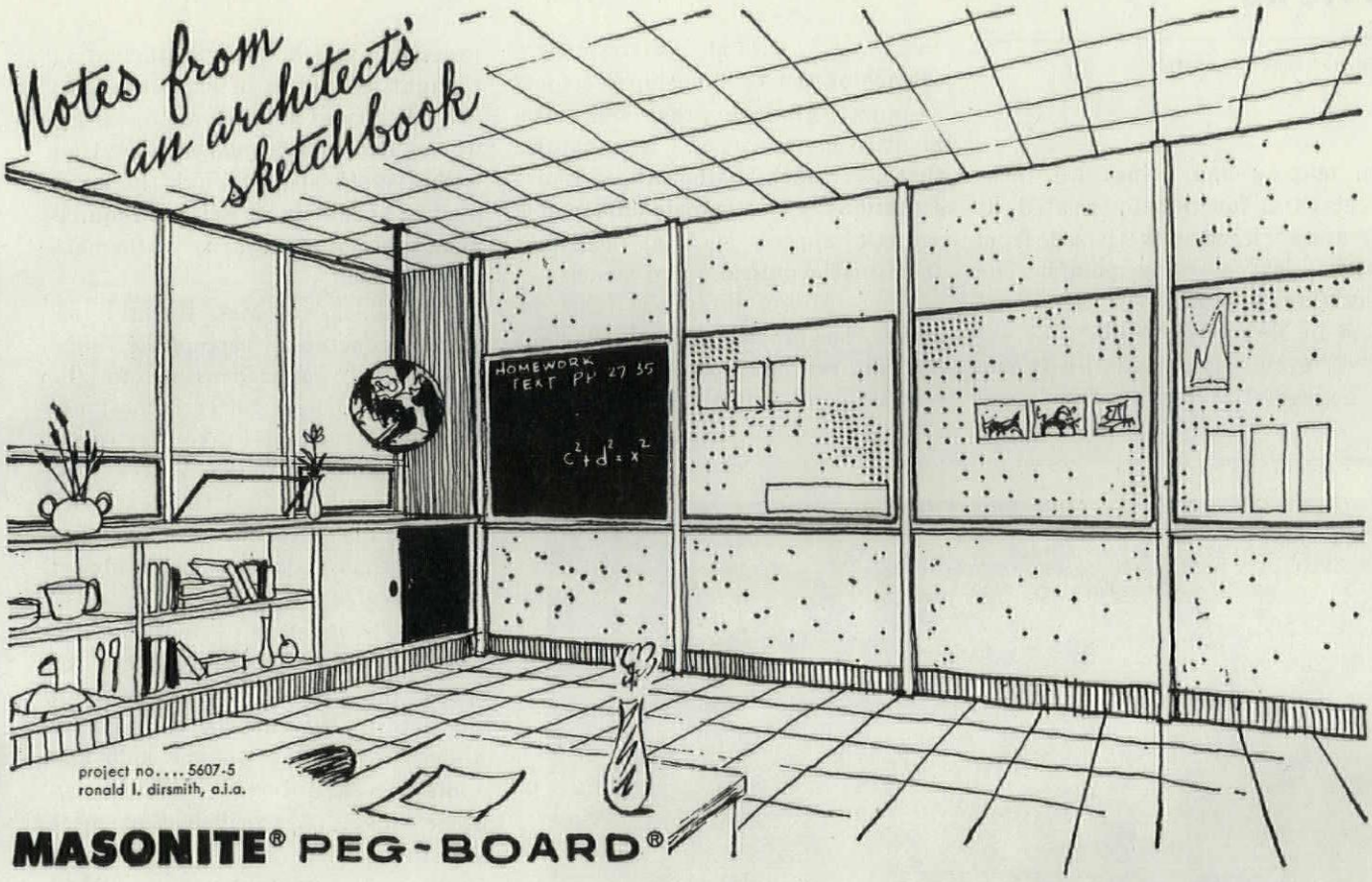
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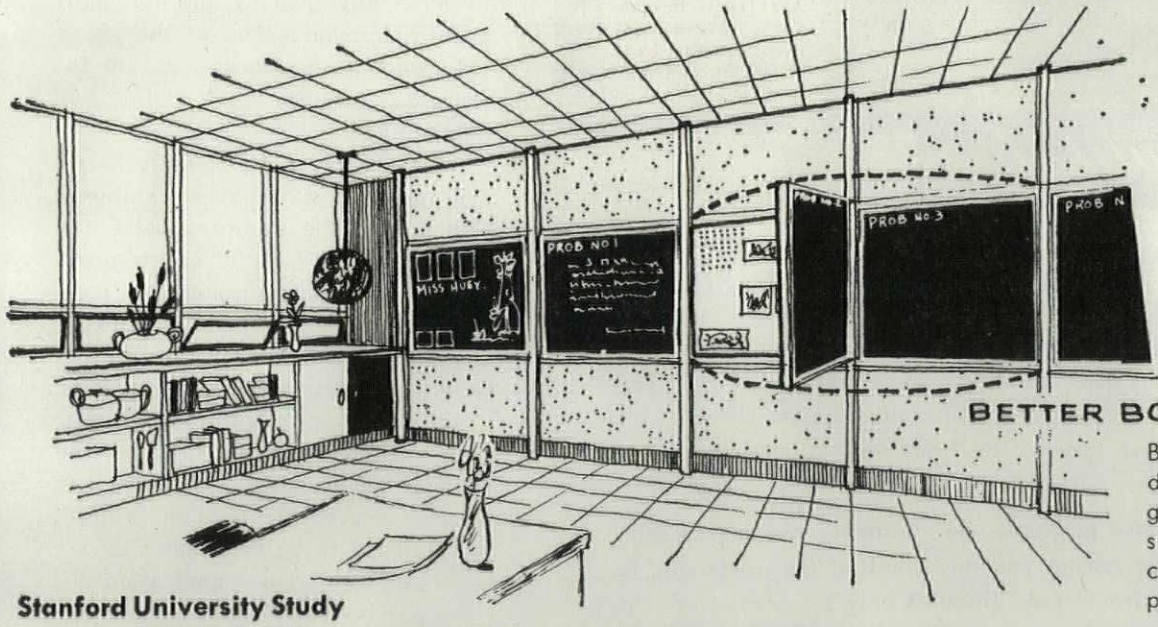
Notes from an architect's sketchbook



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(Continued from page 216)

tion, making and using. All these aspects are functionally related as they are enriched, estheticized, from mathematical starting points. The underlying assumptions are best stated in Max Bill's words:

". . . even as mathematics is one of the essential forms of primary thought . . . it is also intrinsically a science of the relationship of object to object, group to group and movement to movement . . . It is natural that . . . such mathematical representations . . . emanate undeniable esthetic appeal, such as goes out from mathematical space models.

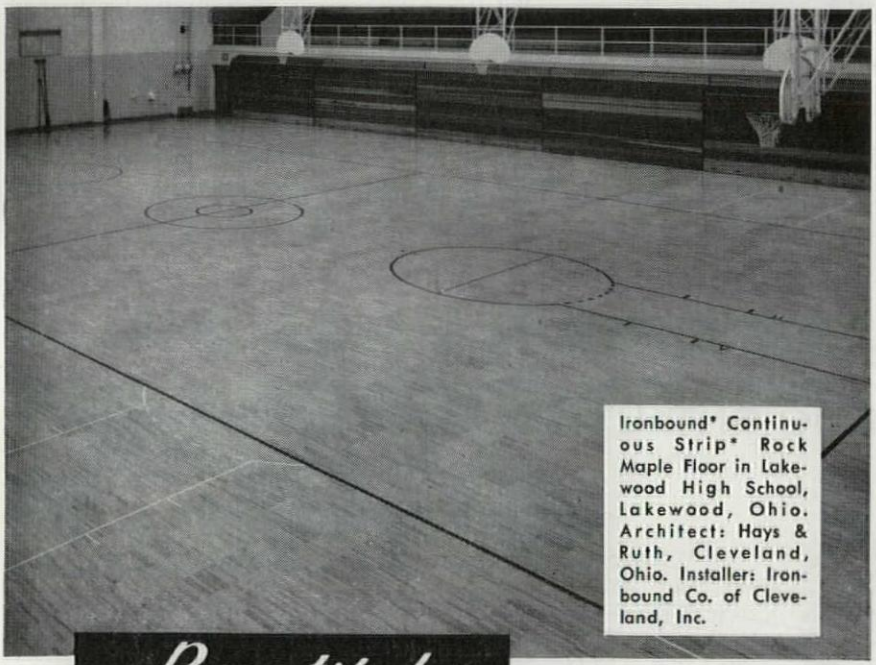
". . . Many inferences can no longer be proved. Human thought has not reached an impasse, but it requires the support of visual expression, which, for mathematical thought as well, is often provided by art. Because he strives toward a whole, the artist endows his vision with a synthesis, although the latter may be primarily an artistic requirement and not necessarily mathematically correct.

"Invisible, abstract thought becomes concrete, perceptible, and consequently apprehensible to the senses; unknown spaces, almost unimaginable axioms take on form; one wanders, through spaces that had not existed, and this exposure widens one's feeling for further spaces, that today are still almost inconceivable, unexplored.

". . . The mystery of mathematical problems, the inexplicableness of space, the nearness or distance of the infinite, the surprise afforded by a space beginning on one side and ending in a different form on another side . . . parallels that meet and the infinite that turns back on itself . . . the straight line untouched by relativity, and the curve, each point of which forms a straight line —all these things that do not seem to have any bearing on our daily needs are nevertheless of the greatest significance. These . . . are the elemental forces underlying all human order."

Such a viewpoint is clearly useful and inspiring to what Buckminster Fuller calls the Comprehensive Designer. And events, if events prove anything, seem to support this position's vitality. New and interlocking awarenesses have been opened between arts, science, and technology. Progressive architectural schools, such as MIT, are training the younger generation in this new esthetic-structural freedom, requiring students to build complex modular structures whose inspiration derives partly from engineering progress, partly perhaps from visualizations of molecular forces or the arrangements of crystals, partly from Bauhaus exercises, and most directly from Buckminster Fuller's energetic geometry. When the returns are in, the role of abstract artists of whom Max Bill is a prototype will doubt-

(Continued on page 222)



Ironbound* Continuous Strip* Rock Maple Floor in Lakewood High School, Lakewood, Ohio. Architect: Hays & Ruth, Cleveland, Ohio. Installer: Ironbound Co. of Cleveland, Inc.

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When the school board saw it they exclaimed, "just like you said it would be . . . more beautiful than we thought it could be." Same old story, it happens again and again, practically every time an architect specifies an Ironbound* Continuous Strip* Hard Maple Floor.

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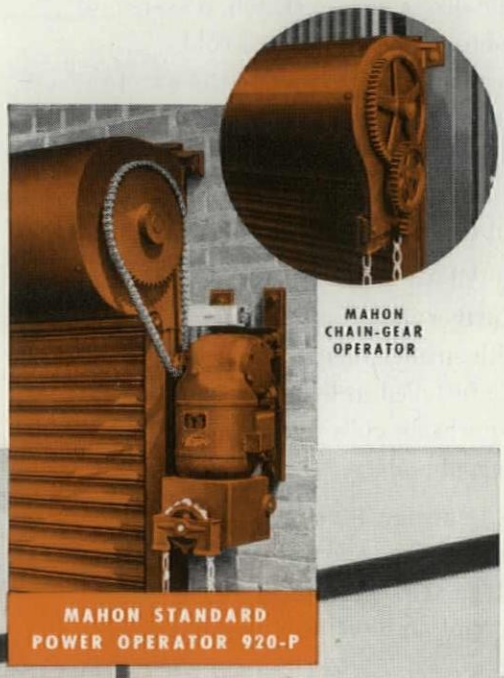
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MAHON

How *high velocity* solves problem of *flexibility* in the Medical Towers

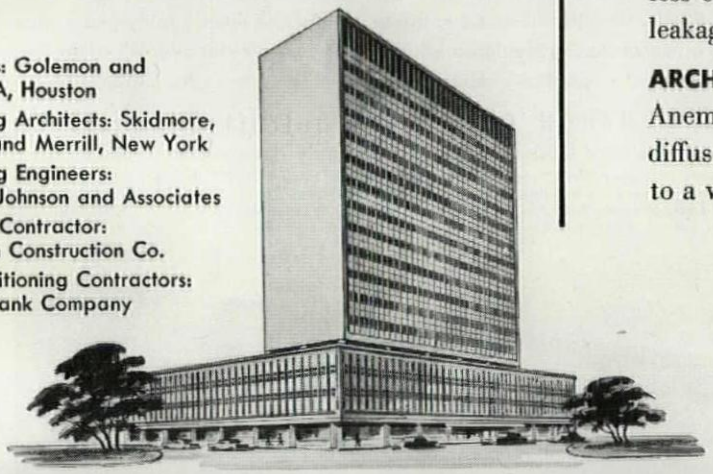
When the new Medical Towers Building in Houston, Texas was planned, the key air conditioning problem was flexibility. Professional office areas had to be subdivided *after* the building was completed. Here's how an Anemostat dual duct high velocity air distribution system solved the problem.

As shown in the diagrammatic sketch, a system of perimeter take-offs from the hot and cold ducts enables each doctor to provide the exact temperature he wants. Temperatures in the various rooms of each suite of offices can be varied. Air distribution is draftless, comfortable, perfectly suited to tenants' needs.

The Anemostat All-Air High Velocity distribution system offers further important advantages. It can be used with smaller than conventional ducts. It can be installed in less time and at less cost. It requires no coils, thus eliminates leakage, clogging and odors.

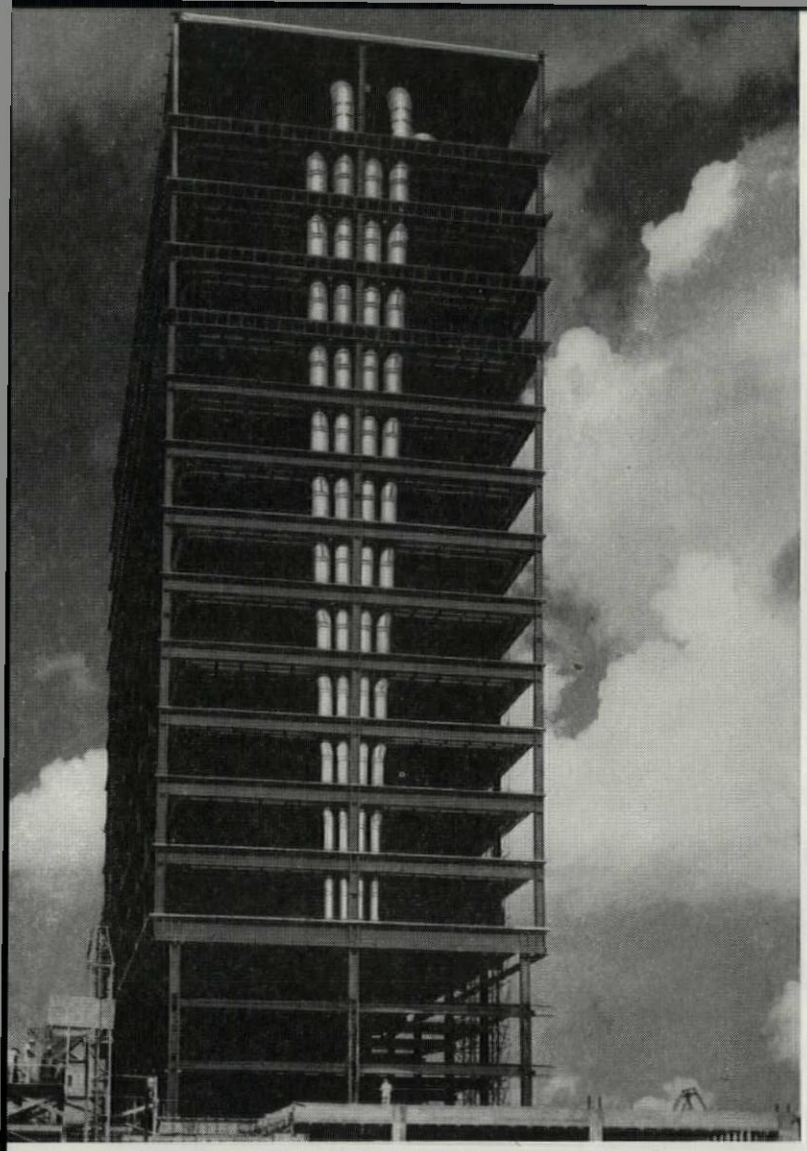
ARCHITECTS—Attention Please:
Anemostat round, square and straightline diffusers with high velocity units are adaptable to a wide variety of architectural designs.

Architects: Golemon and Rolfe, AIA, Houston
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Consulting Engineers: Bernard Johnson and Associates
General Contractor: Tellepsen Construction Co.
Air Conditioning Contractors: Straus-Frank Company



Anemostat HPE units and duct connections installed in office before construction of ceiling and walls





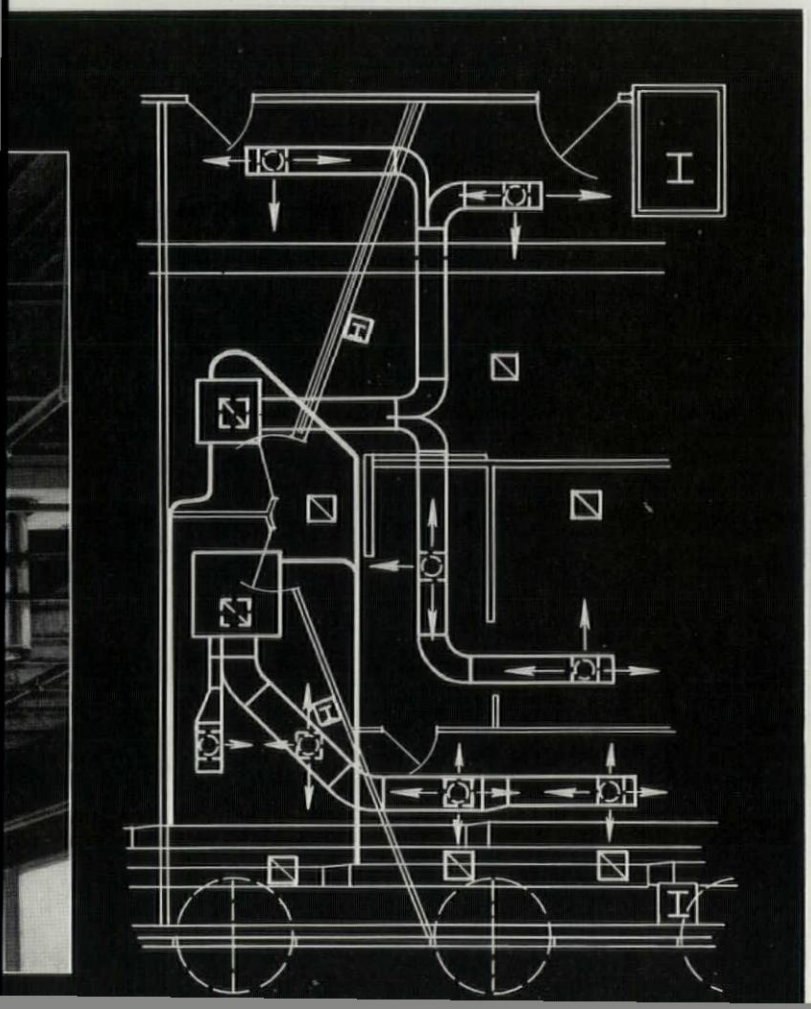
Note how locating of hot and cold ducts saves space in new Medical Towers Building, Houston, Texas



View of lobby showing Anemostat Air Diffusers



View of professional reception room



Layout of typical suite



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ANEMOSTAT: The pioneer of All-Air High Velocity System

(Continued from page 218)

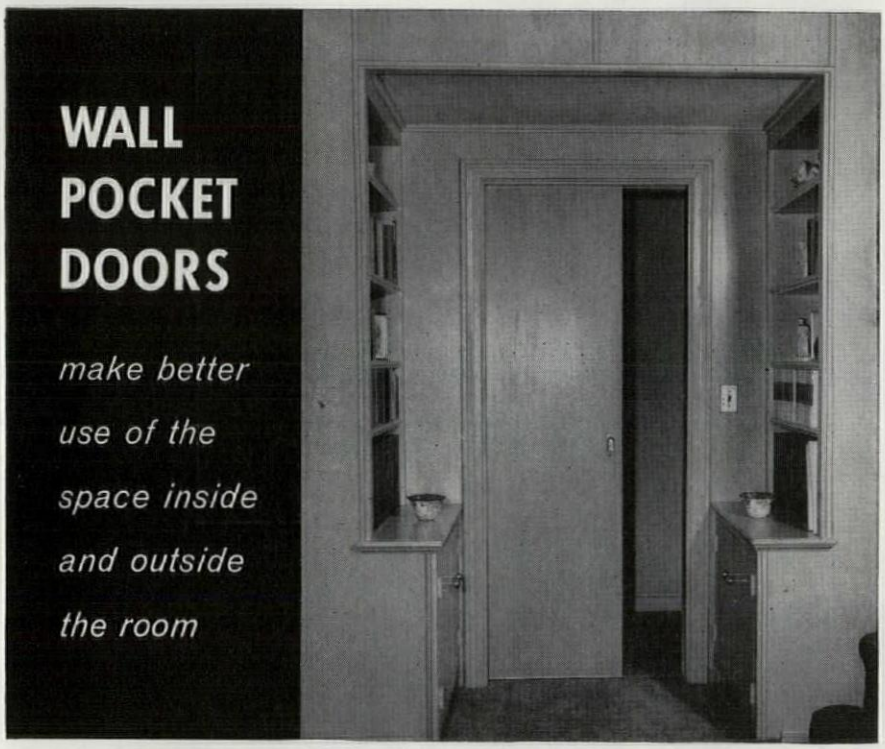
less become more apparent, for a new temperament, a new receptivity and special feeling is involved.

Turning to Bill's painting, not everyone will be happy with most of the work reproduced. Space, plasticity, and Mondrian's "free rhythm" are sacrificed to experiment with groups, with extremely clear-cut (even obvious) relations of order. "White Square," for instance, takes its name from a single white square located asymetrically among nine rows of nine identically spaced, sized and colored squares, a little like the stars on the American flag. "Limited and Unlimited" presents a curvilinear plane that is modeled from light to dark, and whose S-shaped edges are alternately sharp and indeterminate, like a voluminous form partly shrouded in clouds (Bill, of course, has no such figurative associations in mind). These self-conscious procedures have the same strength and weaknesses as Albers' artistic play on phenomena discussed in the psychology texts. History, however, should caution us against taking a narrow view of what constitutes "art" and falling into the fallacy of "nothing but," which might persuade us to shrug such things off as mere exercises.

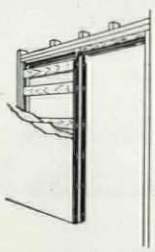
Whatever the value of such researches, Bill's talent—one is often tempted to say genius—lies in his power to endow abstract form with layers of meaning. This, and his decisive sense of space, enable him to design exhibitions and exhibition pavilions, such as the Swiss contributions to the Milan Triennales of 1936 and of 1951, or the Basel exhibition of 1949 entitled "Die Gute Form." They are radiant with optimism, heraldic clarity, and a deep sense of total values. These qualities are united in his entry (which received an honorable mention) to the competition for the Monument to the Unknown Political Prisoner—one of the most convincing entries, to those who believe that the solution should play down personal expression and idiosyncratic stylization, in favor of the universality behind the whole idea.

The problem of the Monument of course raises questions of architectural symbolism, of ideological interpretation, and of scale. Bill's answer consists of three hollow cubes (triadic relationships often replace the duality of classical abstract art in his work). Tunnel-like, and almost touching, they enclose a triangular inner space, in the center of which stands a triple-edged column of chrome-nickel steel, "the symbol of the precise, unconditional and independant attitude of the responsible human being. . . . The column is therefore not only sharply edged, but mirror clear." Dark on the outside, light inside, and converging in their centers like the bellows of a camera, each cube presents an equal number

(Continued on page 228)



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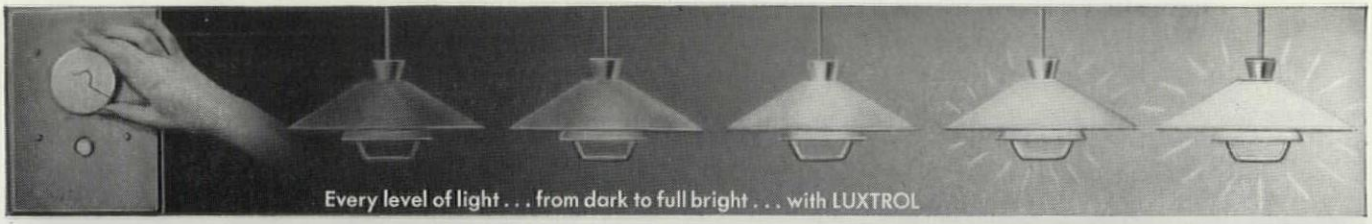
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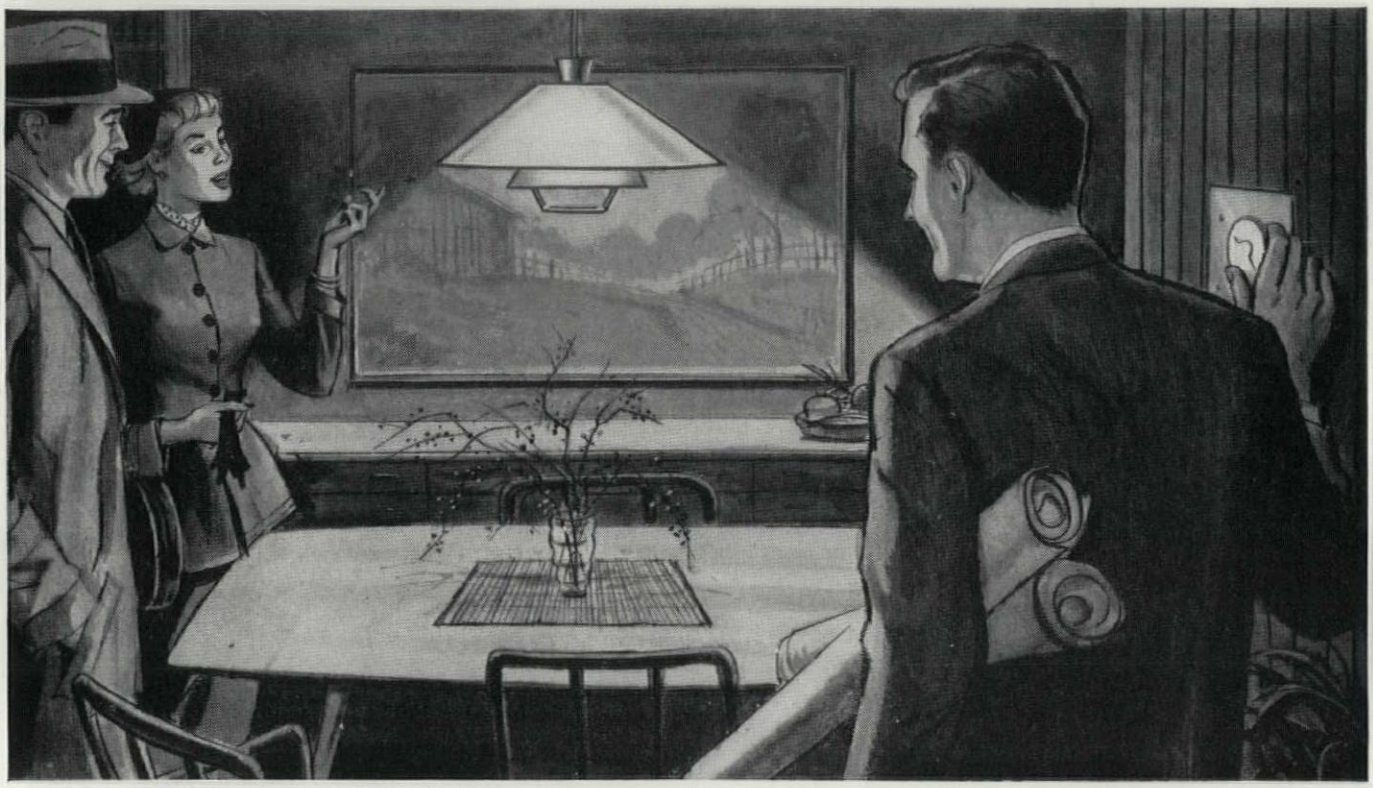
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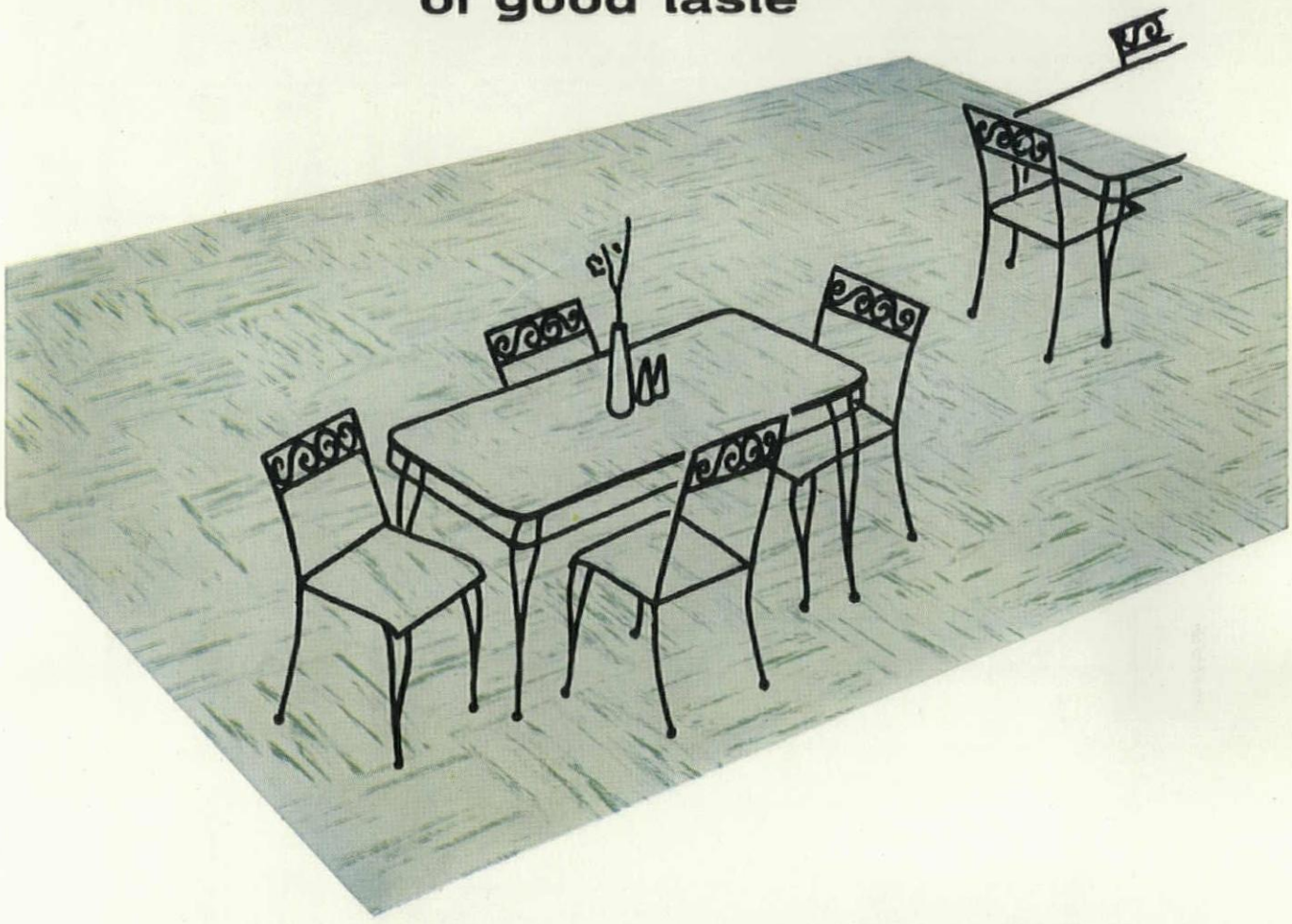
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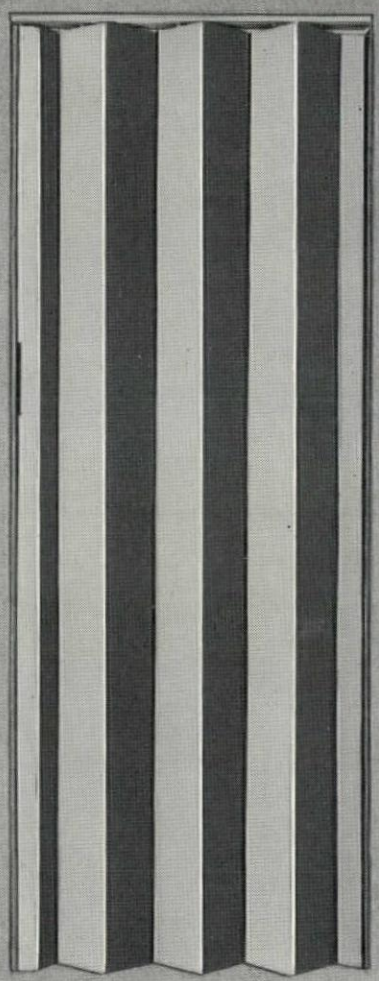
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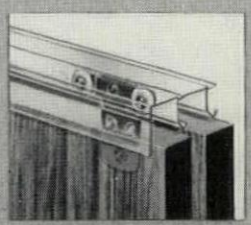
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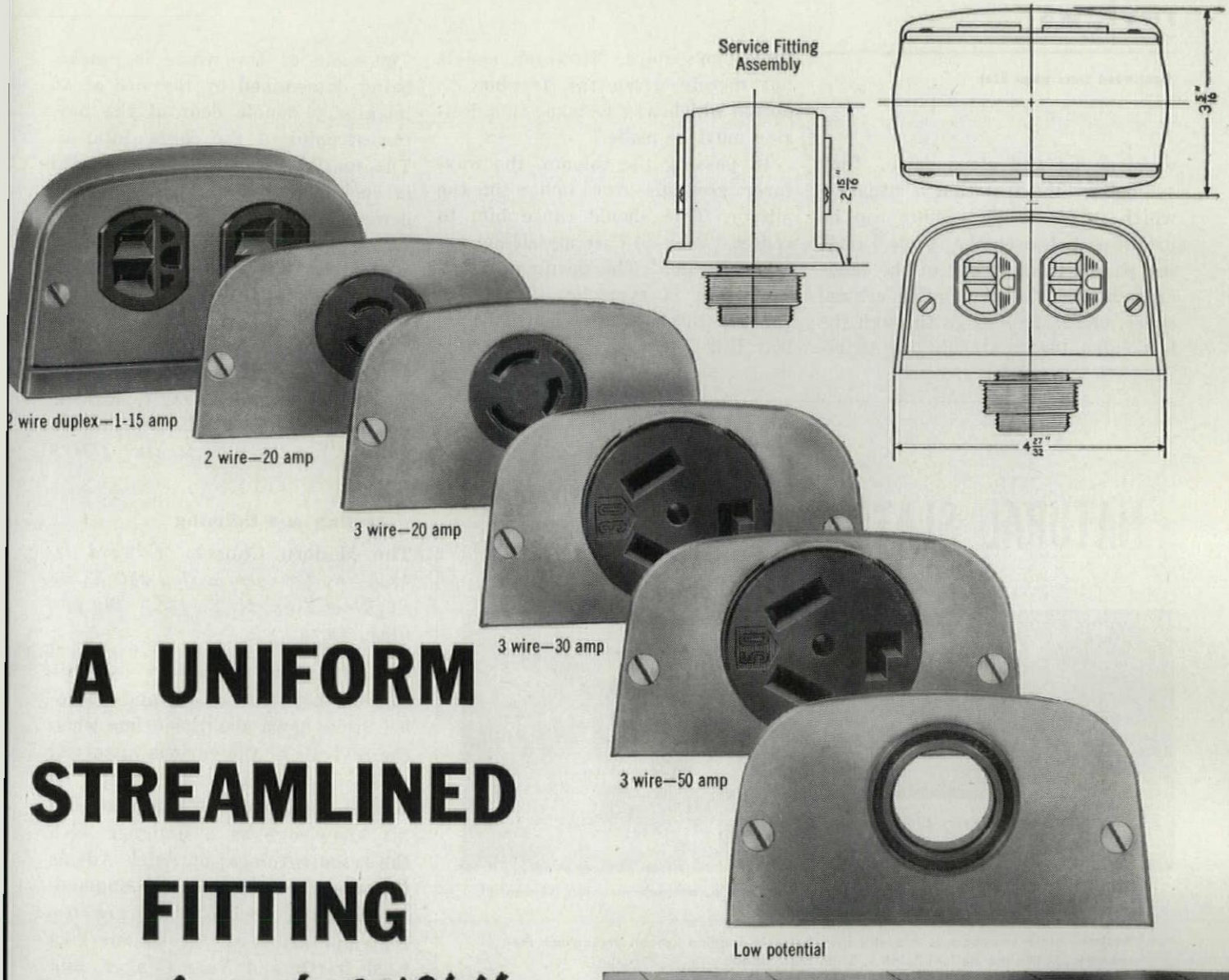
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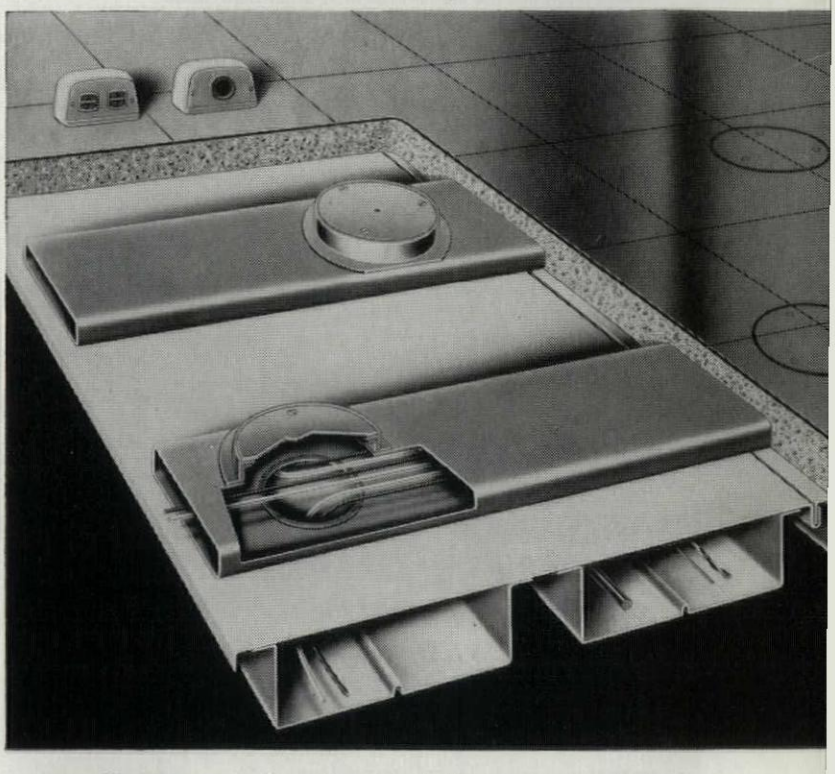
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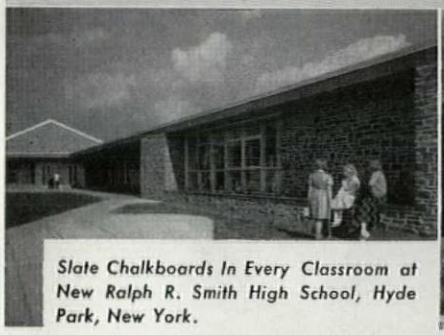
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(Continued from page 222)

of steps up and steps down. They symbolize "the fact that a situation which is outwardly sombre can be bright and clear on the inside." Having passed through one of the cubes and entered the triangular central space, one is free to go through the left cube, the right cube, or to retrace one's steps. "However, one is not merely given the freedom to decide which way to take: this decision must be made."

In passing the column, the wayfarer sees his own image in the mirror. This should cause him to reflect, "Why do I see myself here in this column?" The opening out of the space is symbolic of freedom (and, I think, of the multi-ordinal way Bill tries to look at the world). The scale of the whole is human, being determined by the size of an imaginary double door at the narrowest point of the cubes' interior. The spatial and coloristic treatment is such as to destroy the division beween inside and outside, and between architecture, painting, and sculpture. "We believe that concrete art can help to express precisely those values which are not encumbered by literary or sentimental connotations . . . works with a direct, unequivocal symbolic force, such as symbols for eternity, liberty, human dignity." MARTIN JAMES

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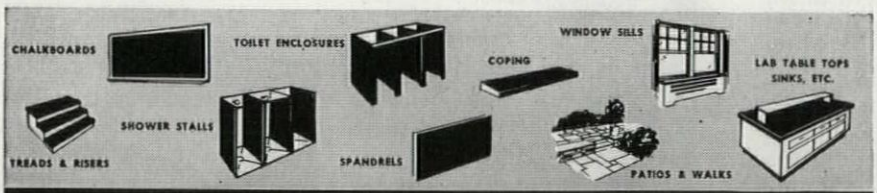


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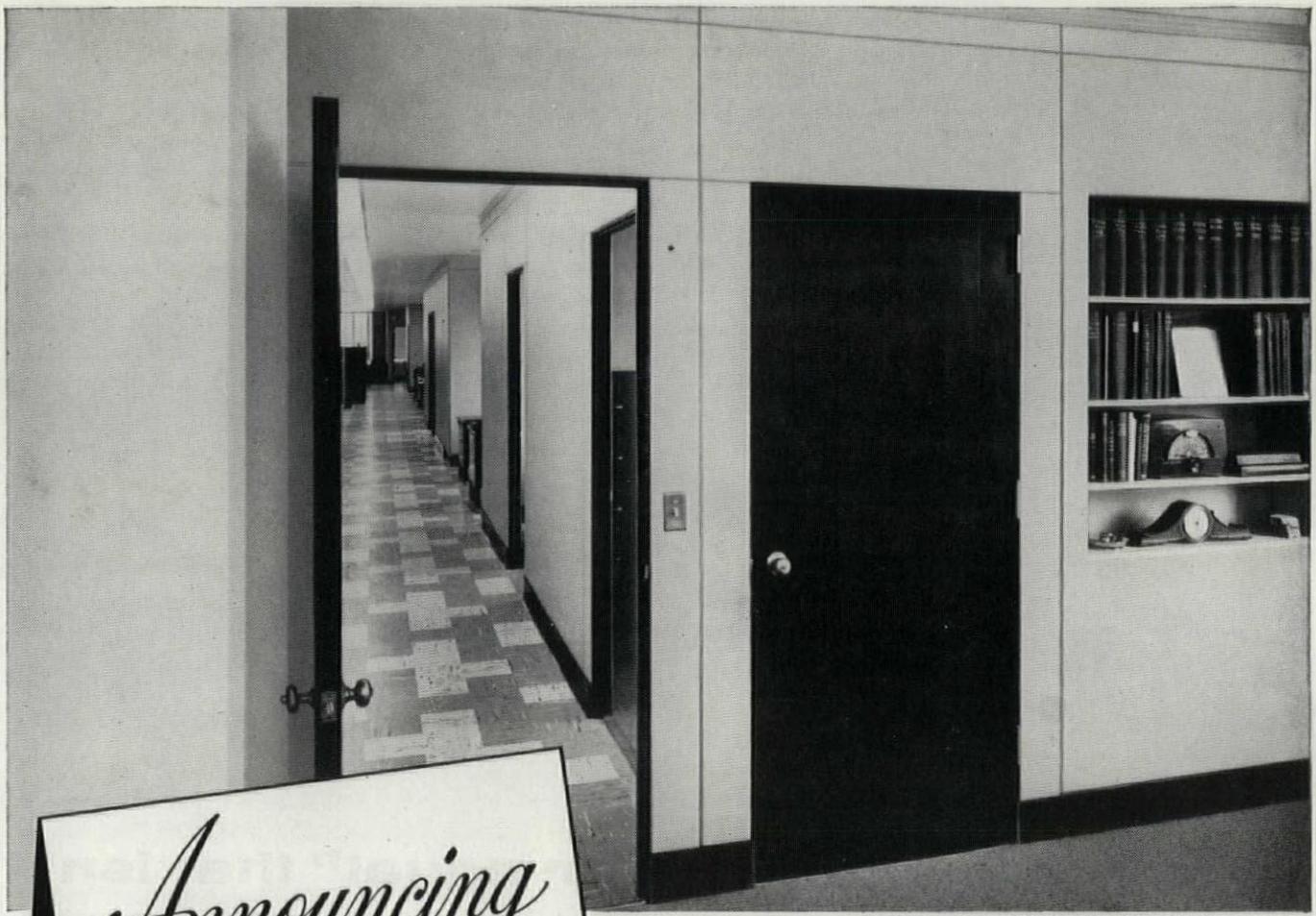
feeling and thinking

The Modern Church. *Edward D. Mills. F. Praeger & Co., 150 E. 52 St., New York, N. Y., 1956. 190 pp., illus., $9.75*

The "textbook" theology of the Church, both Protestant and Catholic, broke down about the time when the revivals of the various historical styles were exhausted. There is no scholar now surviving who could use his knowledge as a designer with the resourcefulness of Ralph Adams Cram or Edwin Lutyens in England. Le Corbusier and Gropius are the contemporaries of theologians like Karl Barth and Yees Congar, and innovations in church architecture have taken place on two fronts: in terms of the program put before the architect and in the formal inventions not necessarily related to any "programmatic" intentions. And—since we live in an age where feeling and thinking are rarely related—these two kinds of development have not often coincided. The church at Pampulha, for instance, which Oscar Niemeyer built some fifteen years ago, has a completely traditional plan; while the Methodist Church at Mitcham, in Surrey England, which represents a relatively new building type (the church as a "social centre"), has not a glimmer of formal brilliance or even interest.

These two illustrations are chosen at random from this same Mills' book on modern churches. If Mills is innocent of any formal brilliance

(Continued on page 232)



Announcing

In this modern office, J-M's new Imperial Marinite Movable Walls insure privacy, are architecturally attractive, meet changing space requirements. The corridor floor is colorful J-M Terraflex® Vinyl Asbestos Tile.

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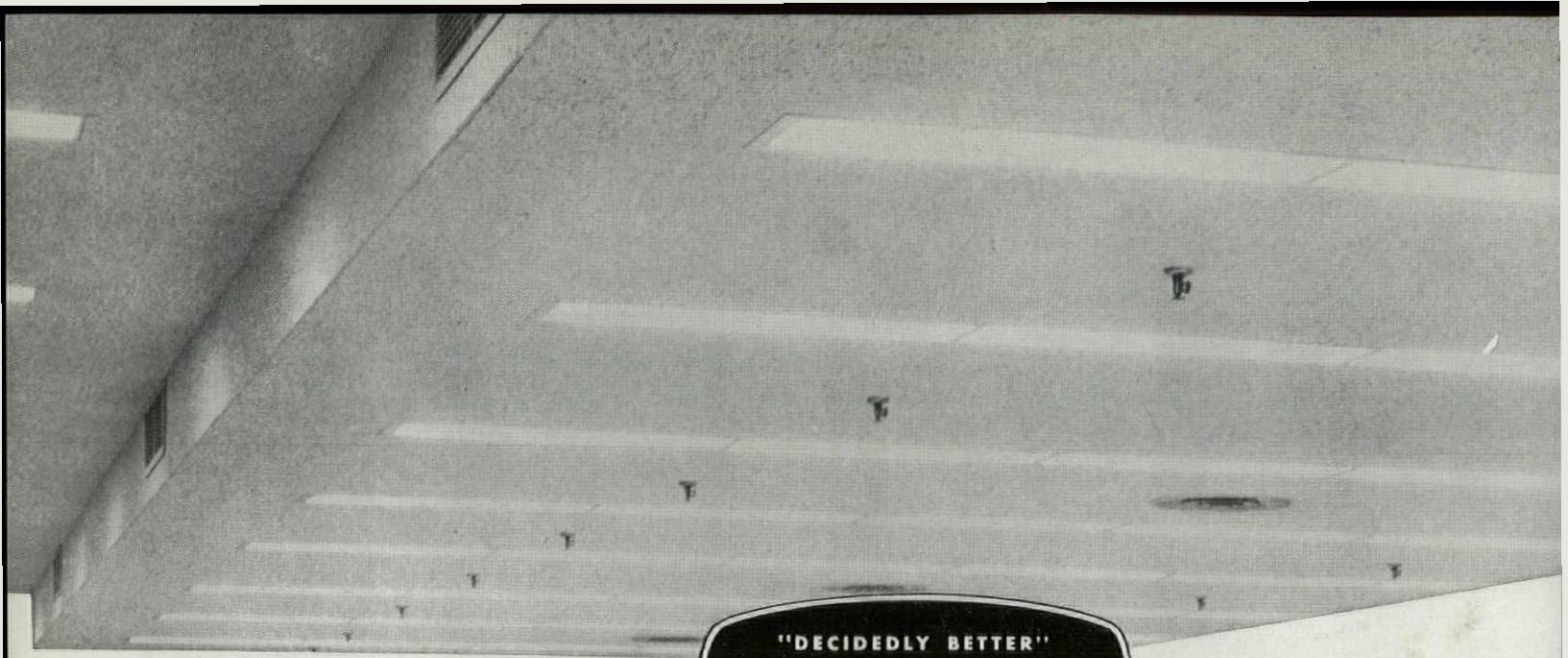
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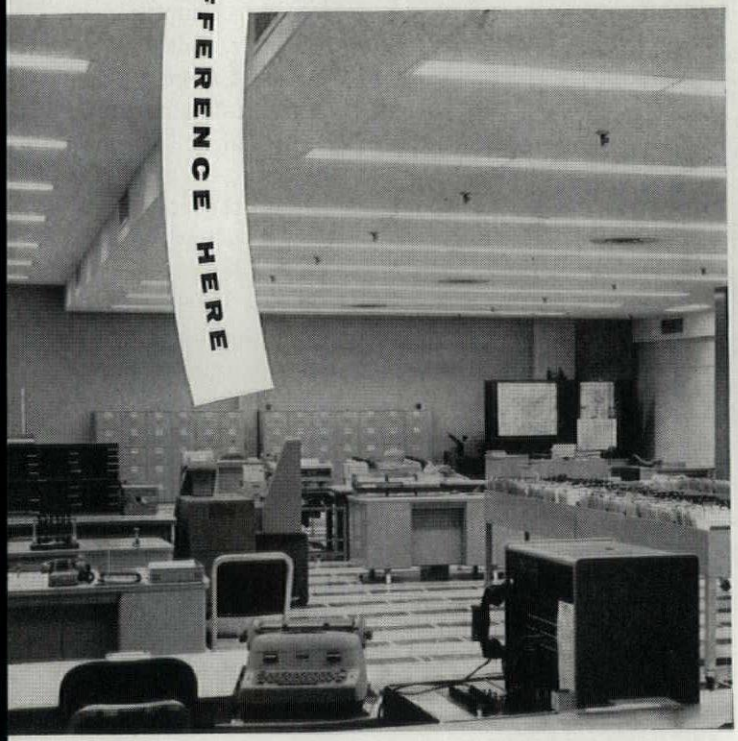
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Office area lighted with Day-Brite recessed troffers.



Typical corridor with Day-Brite recessed troffers.

(Continued from page 228)

in his building he appears equally innocent of recent theological developments in his writings. Though his text is banal, it must be admitted that the examples of recent buildings he illustrates are fairly representative, if only because of the undiscriminating selection. Occasionally, one has serious objections: Auguste Perret's churches are omitted while several and very similar Swiss Roman Catholic churches—plainly of less importance — are included. More serious than the patchiness of the selection is the poverty of presentation. There are photographs and drawings—such as those of Le Corbusier's church at Ronchamps or Mies van der Rohe's chapel in Chicago—which would not have done credit to a student's snapshot album.

But perhaps the blame for the low quality of this particular book is only in part the fault of the author —there is something dubious about the whole *genre* to which it belongs: books about building types, with chatty historical introductions and a hodgepodge of correct but misleading technical data on matters like acoustics or heating. As for those wretched diagrammatic plans of whatever building type, one had hoped they were now entirely a matter of the past. JOSEPH RYKWERT

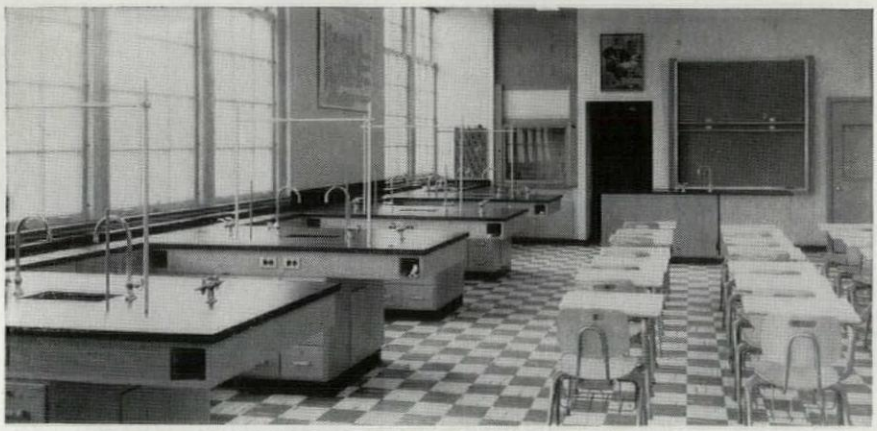
cloudy perspectives

Intangible Content In Architectonic Form. *Amos Ih Tiao Chang. Princeton University Press, Princeton, N.J., 1956. 72 pp., illus., $3.50*

"Void, space, time, and the science of vision are as essential in Lao-tzu's philosophy as they should be to modern architecture. This challenging parallel is developed in an interpretive essay by Dr. Chang, formerly of Princeton School of Architecture and now a practicing architect in Bangkok," the publishers of his well-meant irritating little book tell us. The reader who survives Dr. Chang's prose will learn little more than this about the Chinese Sage of the 6th Century, B.C., about the science of vision, or about architectural composition, on which Dr. Chang's comments are mostly standard stuff transposed into Taoist lingo, so that "flowing space and non-flowing space" become "the being and non-being of flowing."

"You have missed the point," Dr. Chang will reply, "you try too hard. You think of knowledge as something positive. Learning is chiefly forgetting—to learn is to grow beyond your prejudices and preconceptions. Don't be so analytical. Eliminate the positive, accentchoo-ate the negative! With creative forgetfulness latch on to the laws of the universe (so far as they can be known to man)." You will then become a follower of *Tao*, the Way—sometimes translated as the Word, Truth, or Nature.

(Continued on page 238)



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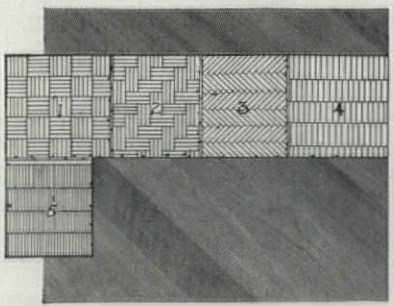
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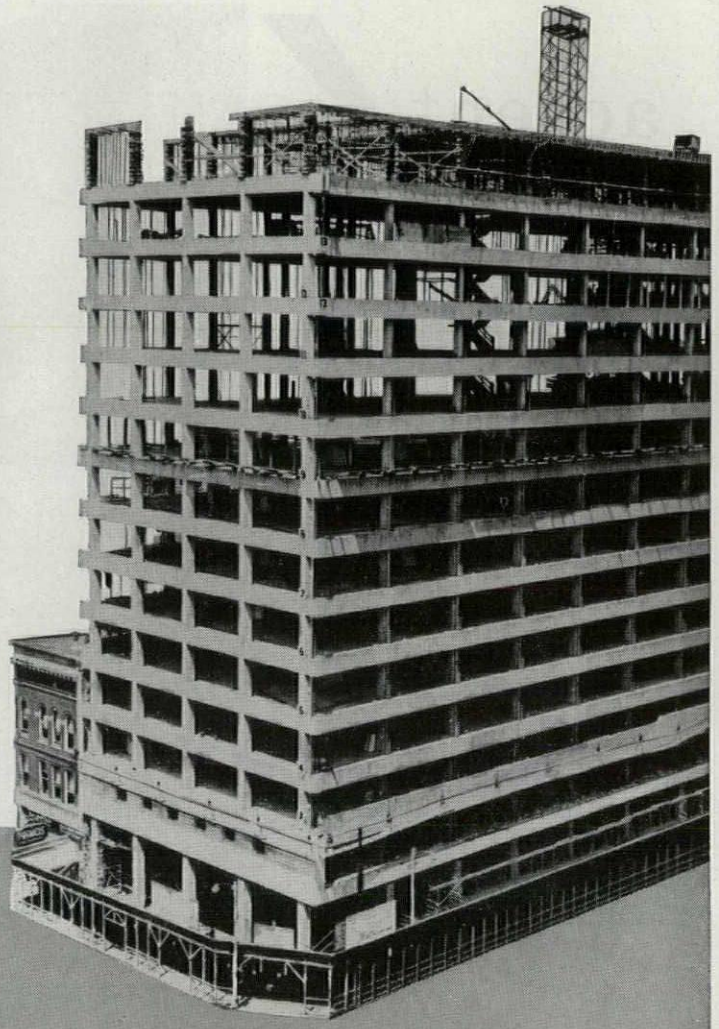
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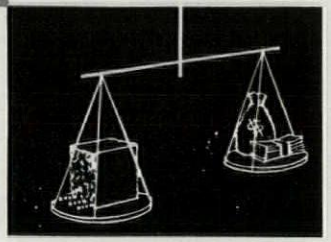
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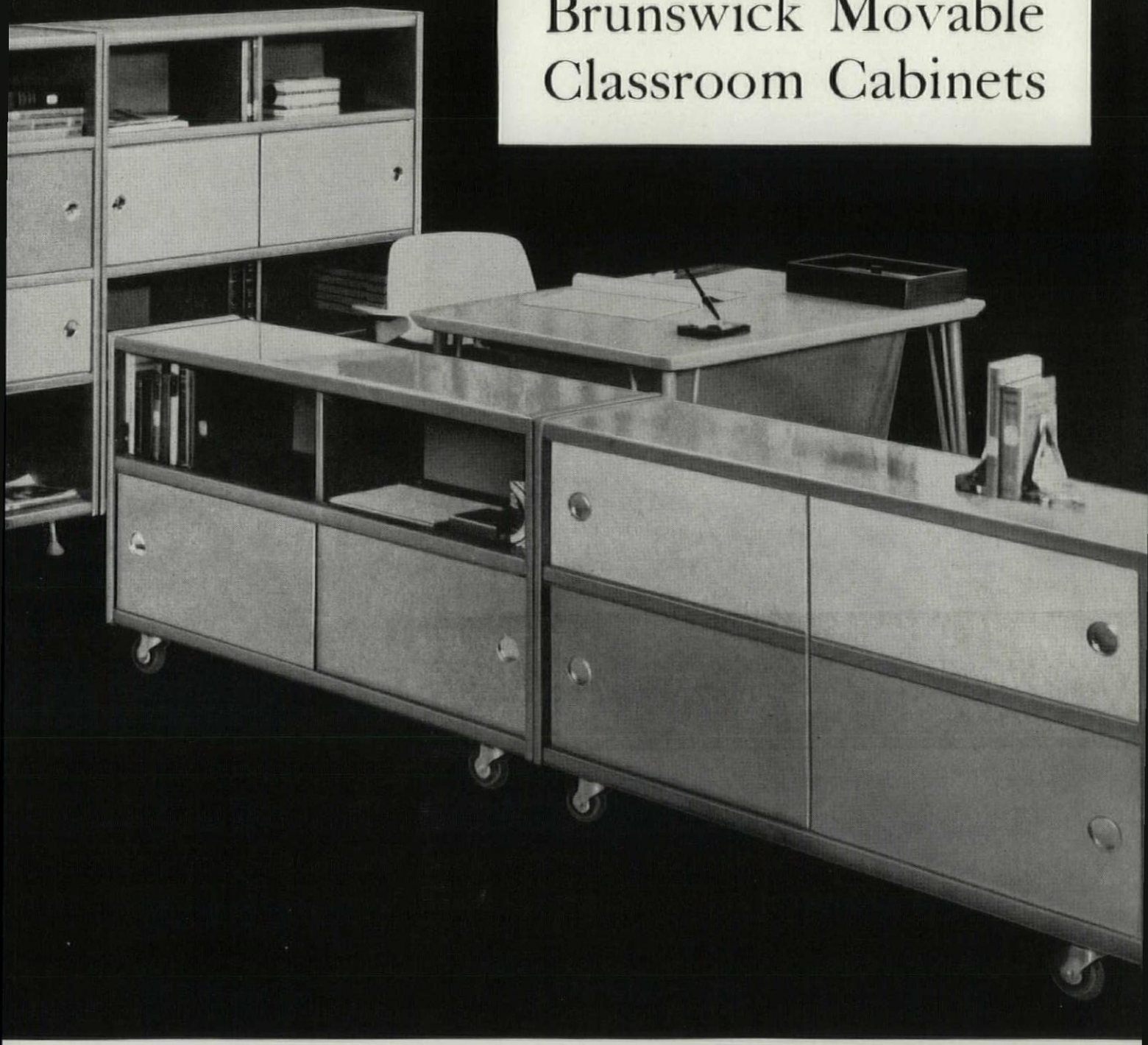
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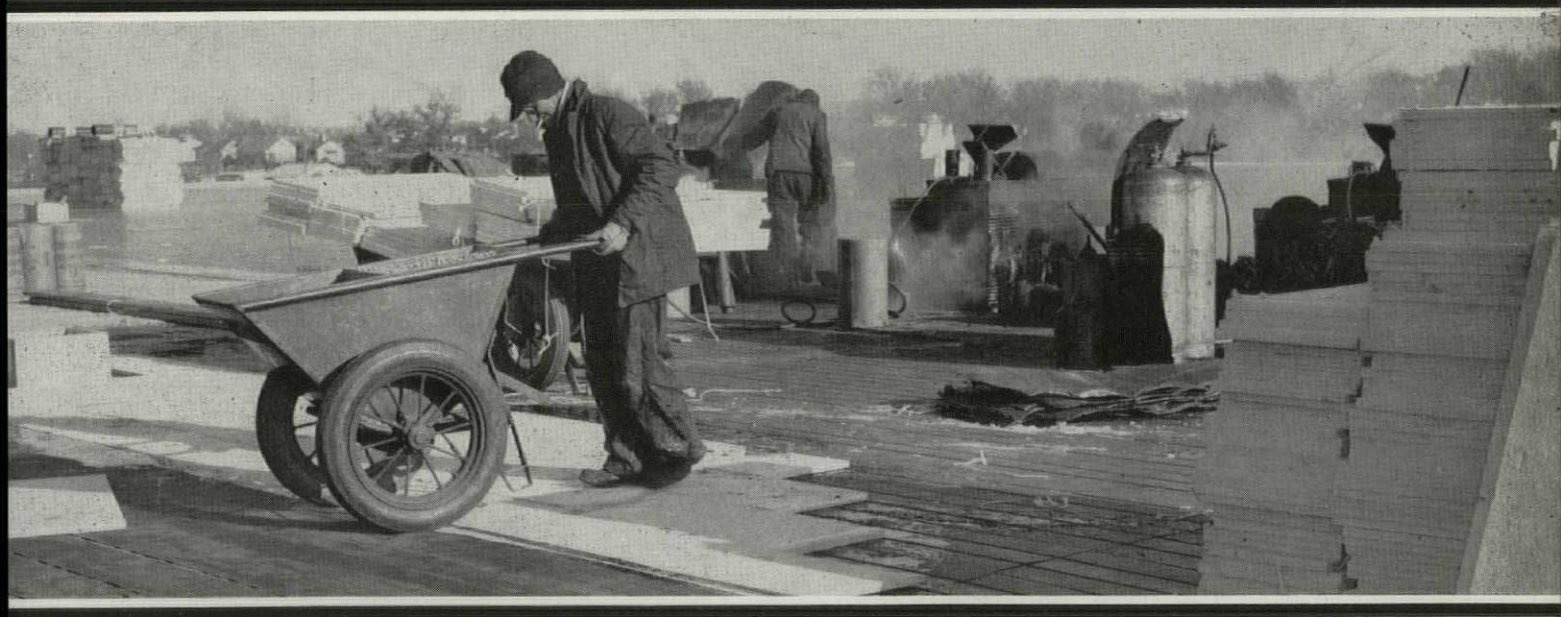
Specify Insulite for the extra rigidity of hardy Northern wood

The photos at left and below show the typical heavy loading, and busy roof-top traffic, involved in today's roof application methods.

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reviews

(Continued from page 232)

Nothing is Something. The empty is as valuable as the full, void as volume; flux as stability; the imperfect as the complete. Space permits relationship; and in space, life can evolve and realize its potential. Relationship is more important than the individual objects related. "Knowing that any cluster of stars is formed by their surrounding emptiness, one must not deny the fact that the unity between San Francisco and New York City is formed by the two oceans and not the railroads."

All this conforms with modern taste which rejects the cult of the material object for its own sake, loves whole and clear relationship, respects the law of least effort, and honors intuition. The Mies-ian doctrine of "Less Is More" agrees to a great extent with various Eastern esthetics. The long silences in John Cage's music are partly inspired by Zen Buddhism, characterized by a Jujitsu-like mockery of those who *try* too hard and spend themselves in clumsy effort instead of finding illumination in their inner resources. Already in the West when Pieter Brueghel represented that first skyscraper, the Tower of Babel, as the most colossal, the most uneconomical, the most misdirected architectural blunder of all time, he sensed perfectly this anti-materialistic viewpoint. If ease is attained through striving and sacrifice, yet understanding comes when one is trying least—this is one of the paradoxes that bewilder the neophyte trying to encompass the world with his limited logic. Zen Buddhism, long linked with art, especially with the great Japanese "spontaneist" painters, would appear to offer a richer vein than the Old Philosopher who held that "the Sage, when he governs, empties the peoples' minds and fills their bellies.'

In contrast, too, the Shinto tradition of Japan can be regarded as the "Nurse of the Arts." Shinto, a religion of primitive peasantry and arti-

(Continued on page 242)

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reviews

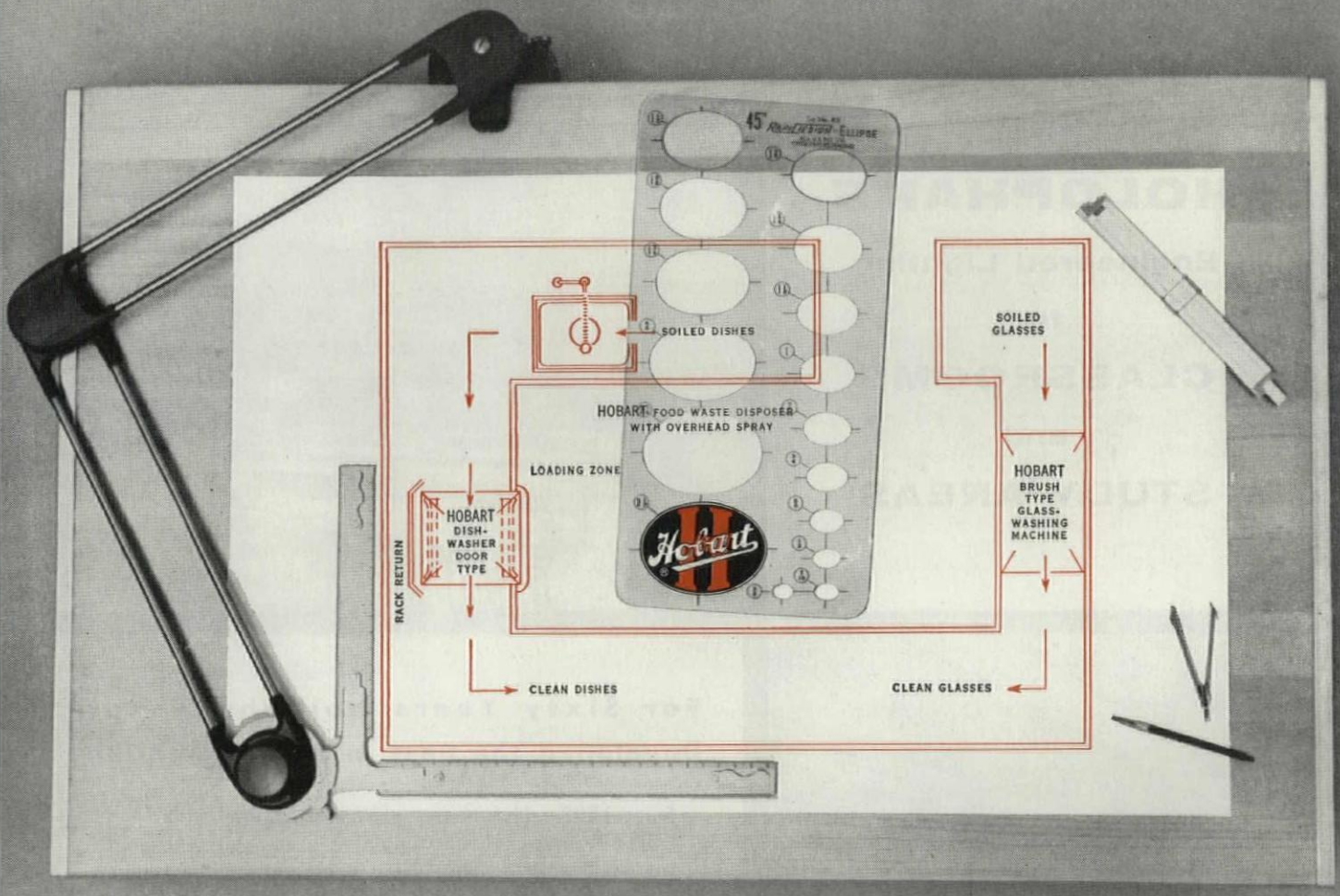
(Continued from page 238)

sanship, recognizes the indwelling spirit of each thing, with which the craftsman must make his peace. Imprisoned in the freshly cut log, the tree-spirit will struggle to escape—and warp the wood. Co-operate with it, give it time, and the wood will become (as we would say) seasoned. Common, however, to all these Oriental viewpoints, including Indian Yoga —which seeks ways of co-operation with body and mind—is what Western culture has denied or ignored: that the universe has certain fixed laws, immutable, compelling, and to them man's efforts are often ridiculously at cross purposes.

Like most ancient agricultural peoples, the Chinese, even before Lao-tzu, realized that nature, with its seasons and floods, follows timeless purposes and designs, to which man must willy-nilly adapt. Such is the burden of Hersey's recent novel. Even more important, it would seem, for the pacifist, laissez-faire, and inactivist Lao-tzu, is the fact that the Chinese peasant, pawn of the warlords, asks only to be let alone to cope with life, untroubled by ambition, greed, war, taxation, and bureaucracy. Lao-tzu was less concerned with the religious, metaphysical or artistic, than with good government and the good life. "With Tao, a corpse could govern the Empire," it was later said.

Thus we read in Lao-tzu the apparently architectural statement: "The heavy is the foundation of the light; repose is the ruler of unrest." But he goes on: "The wise prince in his daily course never departs from gravity and repose." It is not quite as if an esthetic theory were to be built on the figures of speech in Christ's Parables. Admittedly, "Blessed are the meek, for they shall inherit the earth" is not so flexible a statement as "Failure is the foundation of success . . . he who acts, destroys. . . . Therefore the Sage does not act . . .

(Continued on page 246)



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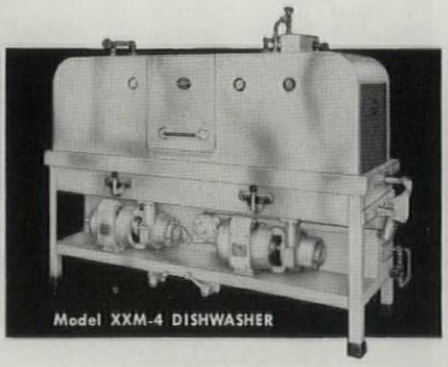
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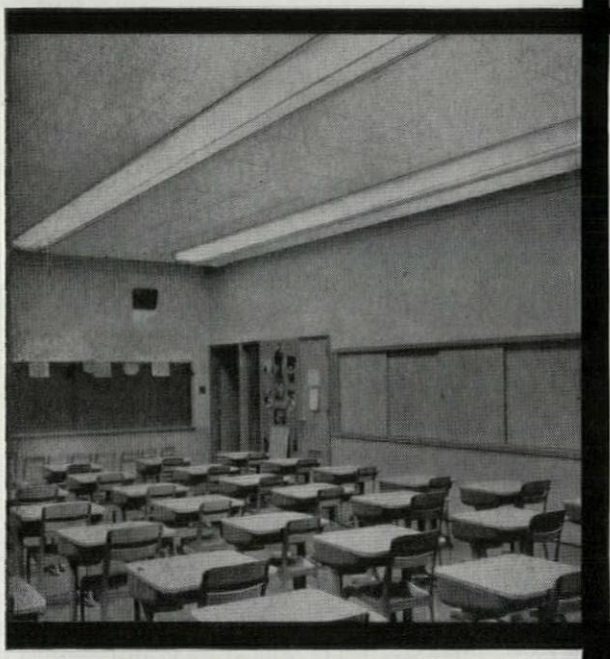
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Center: CLASSROOM — Locust Grove Elementary School, West Mifflin Township, Penna. . Continuous rows of Holophane Surface-attached Fluorescent units . . . Illumination—50 footcandles.

Bottom: KINDERGARTEN—Hope Valley Elementary School, Hope Valley, R. I. . . . Close-ceiling Mounted Holophane PARADOME Luminaires, 300 W. Incandescent . . . Illumination—33 footcandles.*



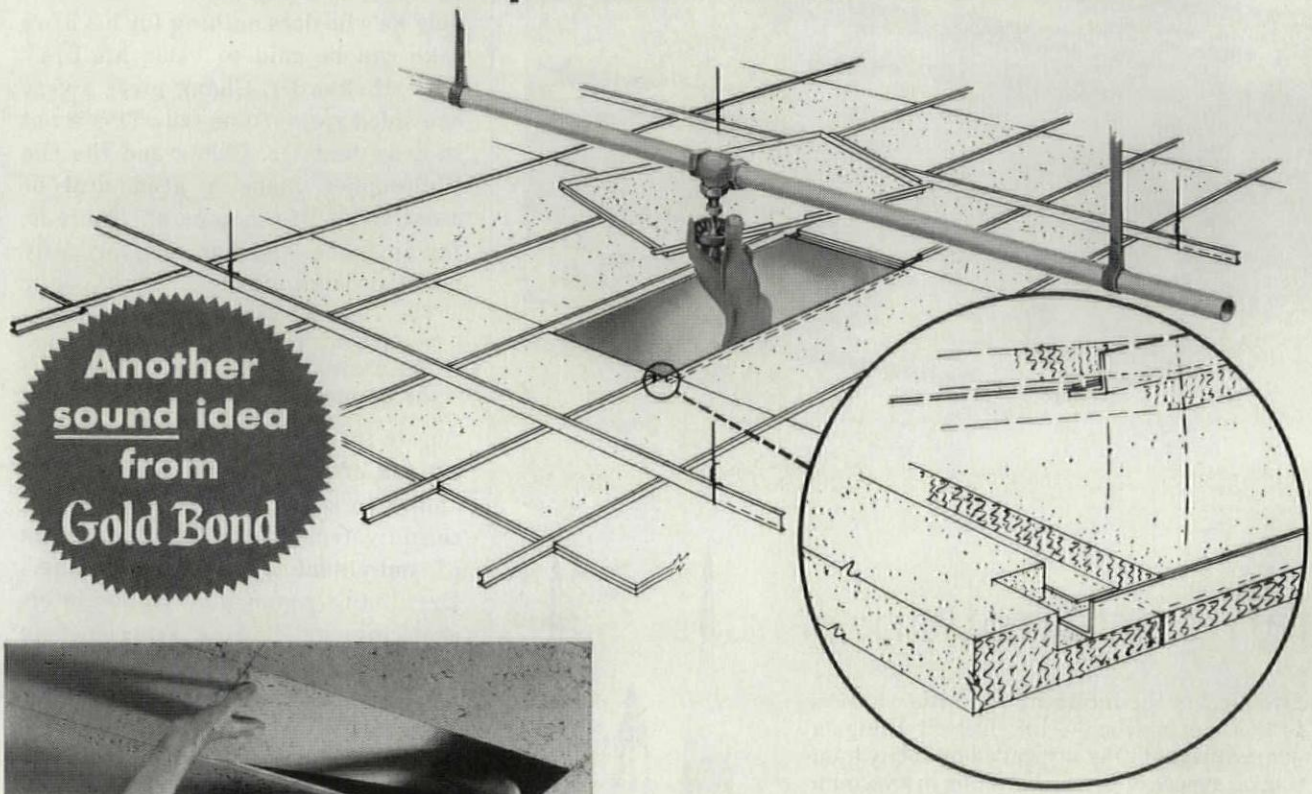
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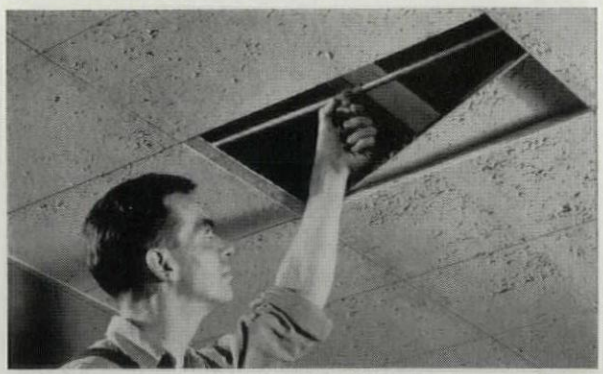
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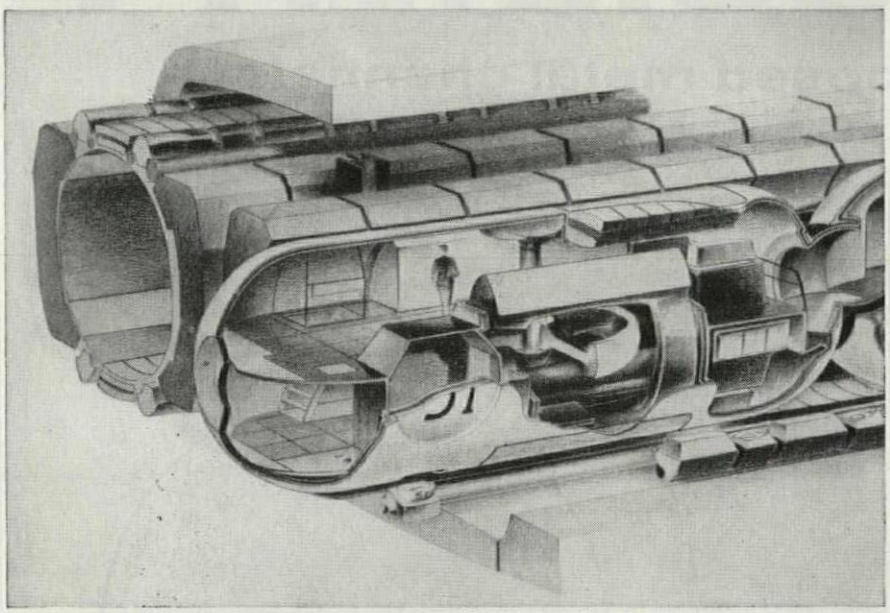
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reviews

(Continued from page 242)

only he who does nothing for his life's sake can be said to value his life." Nevertheless Dr. Chang gives a very one-sided view of Lao-tzu. This is not to deny that Dr. Chang and the Old Philosopher make a good deal of sense about life in general. There is, for instance, the fine, and properly negative beginning:

"The Tao that can be told is not the permanent Tao;
The names that can be given are not the permanent names."

Surely this is a comment on the limitations of man's knowledge, his inability to know, in any simple sense, the universal laws underlying the flux of individual appearances. "Life," Dr. Chang comments, "is an interchanging and flowing experience in which nothing could be permanently held or absolutely known."

"Limited by space, a frog in a well cannot understand what is an ocean;
Limited by time, an insect in summer cannot understand what is ice."
—Chuangtzu

Nor has Dr. Chang overlooked one of the most apt quotations from an architectural point of view:

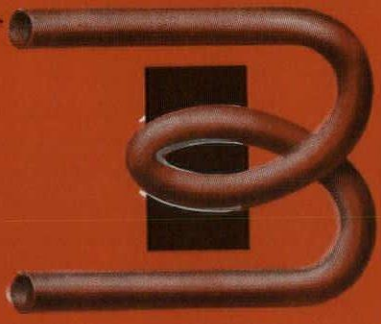
"Moulding clay into a vessel we find utility in its hollowness;
Cutting windows for a house, we find utility in its empty space.
Therefore the being of things is profitable, the non-being of things is serviceable."

What sounds like a homily by the first-year critic goes on, however, to the ethical-political: "When shrewdness and sagacity appear, great hypocrisy prevails. . . . Cast off holiness, rid yourself of sagacity, and the people will benefit a hundredfold . . . outward show is insufficient." Or, on second thought, is this something for the designer who tends to smugness? Dr. Chang, at any rate, draws the conclusion: "Void, conventionally regarded as negative, actually is more important because it is always capable of being filled by solid . . . architectural composition is based on the time factor . . . a minimum amount of

(Continued on page 248)

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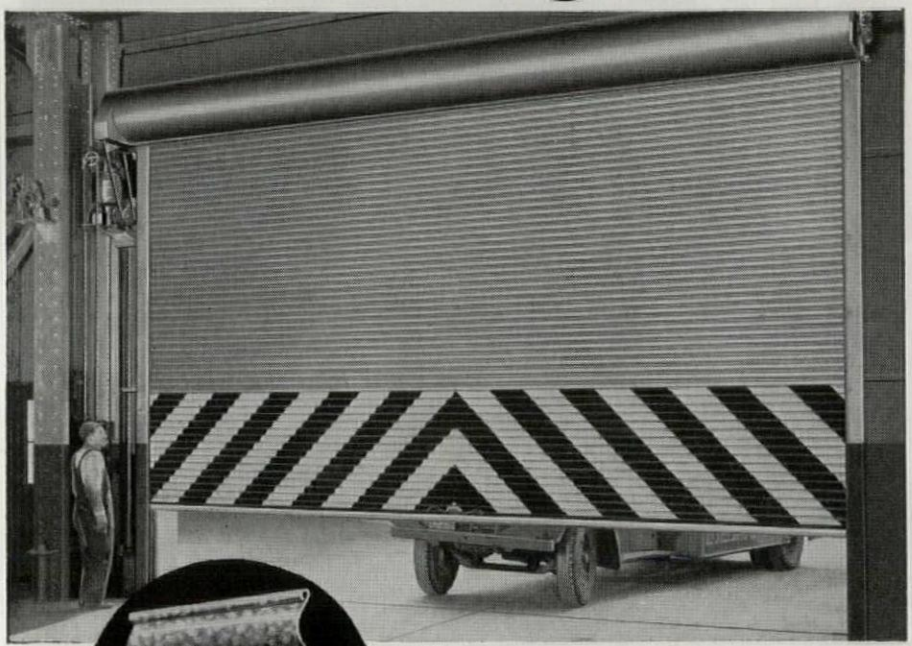
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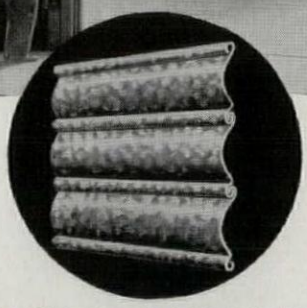
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reviews

(Continued from page 246)

time for circulation is desirable . . . of two classrooms of the same capacity, the one which is continuously used on a one-hour basis probably needs more centralized location than the one which is used . . . on two-hour basis."

So far as Dr. Chang's treatment of the science of vision is concerned, there is, besides a number of vaguely Gestaltist diagrams, a Taoist restatement of rather elementary facts: the "negative" halo around color, after prolonged gazing destroys the original color; grayness, viewed as negative, makes a color more capable of harmonizing with other colors; the human eye is imperfect, but its very Deficiency is useful, for if far and near are not in focus simultaneously, our space perception is enhanced; forms that are fragmentary or deficient, like a circle that is not fully closed, are more interesting than forms we conventionally call perfect, for they have an opportunity to grow.

Dr. Chang's insight on volumetric composition may have some utility if only because of the Deficiency of good books on the subject. A polygonal volume implies an invisible curvilinear envelope. Contraction can make a space seem larger, as with an interior canopy. And so on, through invisible lines and axes toward the idea of extensive large-scale composition, in fact environmental organization. "In view of the fact that crowded massiveness in architecture usually symbolizes the decline of human progress, the natural space so preserved should be recognized as a living, lifegiving and creative vacancy for growing and transitional replacement in the future." A good thought for an age of ruthless conurbation.

Despite his dearth of positive information, the muddiness of the great Taoist river, and the roundabout trip to a pre-Confucian age, Dr. Chang has a way of seeing that is valuable. True, he does not bring a new dimen-

(Continued on page 250)



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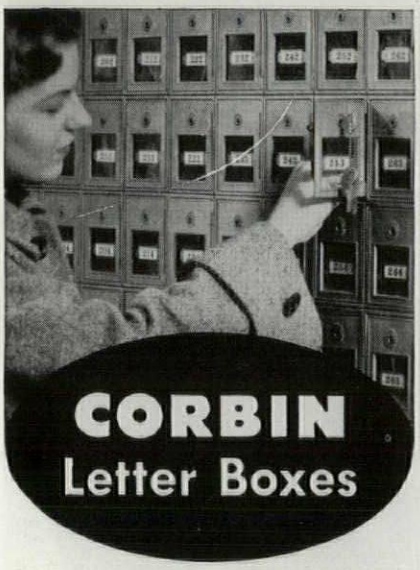
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reviews

(Continued from page 248)

sion to architecture; but he views it from a distance which allows for something outside of the picture frame. Without wishing to underrate the Old Boy (Lao-tzu is said to have been born in his eighties, with a long white beard) we could easily name half a dozen sources that would have enriched Dr. Chang's study: Rudolf Arnheim's masterly *Art and Visual Perception;* Eugene Raskin's semantic excursion, *Architecturally Speaking;* Kurt Lewin's *Principles of Topological Psychology;* Frederick Gibberd's *Town Design;* and (right on the doorstep) Princeton's Visual Demonstration Center.

The reproductions of ancient Chinese paintings give a certain understanding, but this never becomes explicit. Their views open into endlessly growing, freely interlocking space, where mountains and palaces, depicted with painstaking virtuosity and airy detail, are eaten away by vast areas of cloud and mist: Nothingness that is also Something. Unfortunately, in Dr. Chang's cosmic perspectives there is altogether too much cloud. MARTIN JAMES

trial and transition

European Architecture in the Twentieth Century. *Arnold Whittick. Volume Two, Part Three. Philosophical Library Inc., New York 16, N. Y., 1955. 271 pp., illus., $10*

The years (1924-1933) covered by this second volume of a three-volume series were significant. In many parts of Europe, these years were a time of trial and transition; changes in the fields of economics (depression in business, trade restrictions) and of politics (Fascism, Communism) were reflected in all the arts, and especially in architecture.

The forces at work in architecture were confusedly mixed. The resulting architectural trend was not clear.

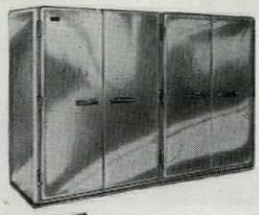
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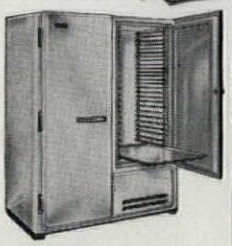
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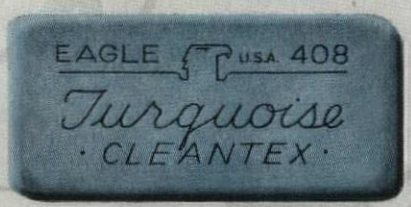
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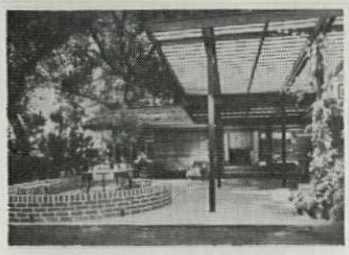
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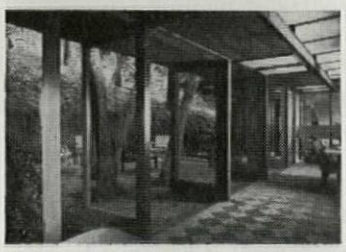
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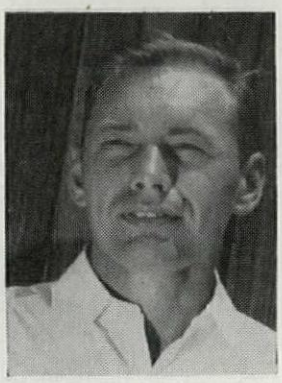




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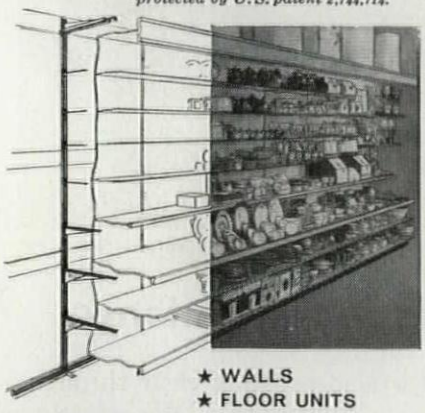
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reviews

(Continued from page 250)

The traditional design approaches were being seriously questioned: some were being discarded; others were being modified; the functional approach was developing.

Out of the confusion, the early forms of the International school were becoming identifiable; architects, later to become internationally famous, were rising above the crowd. The drawings and photographs of this book might be considered to show how poor were many of these early attempts to break the traditional mold; but, on the contrary, they show how good these early results were in comparison with what had preceded. They show not how wrong these architects were, but rather how right they were. In fact, some of the industrial and commercial buildings of the period have not been surpassed.

To some readers, the lengthy, detailed discussion of the various unremembered architects and their unknown buildings will seem boring; to many younger readers, much of the text will make tedious reading. However, a look backward by means of this book will reveal not how much the pioneers of the modern movement failed; but rather how much they succeeded in a brief time, in face of great obstacles. It will provide encouragement to hope for greater advances in the future.

LAWRENCE E. MAWN

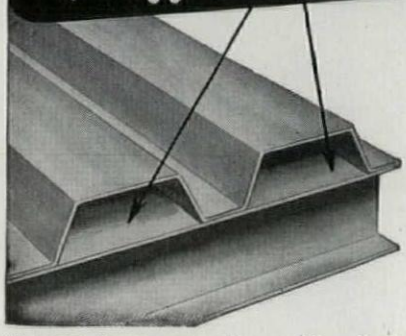
the camera's eye

Southern Interiors. *Samuel and Narcissa Chamberlain. Hastings House Publishers, 41 E. 50 St., New York, N.Y., 1956. 172 pp., illus., $15.*

Samuel Chamberlain with his eye, pen, and camera has done more than anyone else in this decade to make us conscious of the architectural landscape which surrounds us in the

(Continued on page 262)

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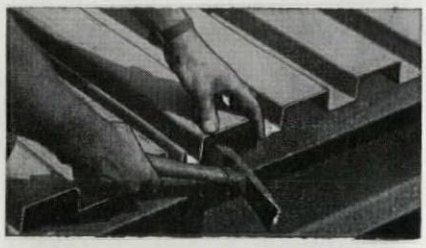
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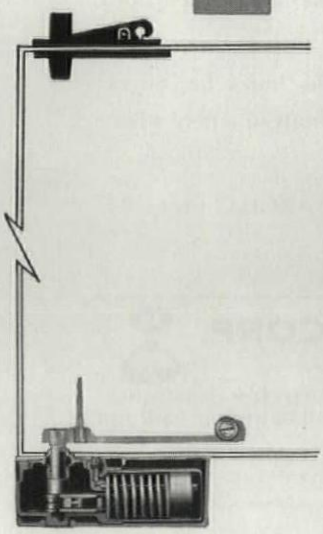
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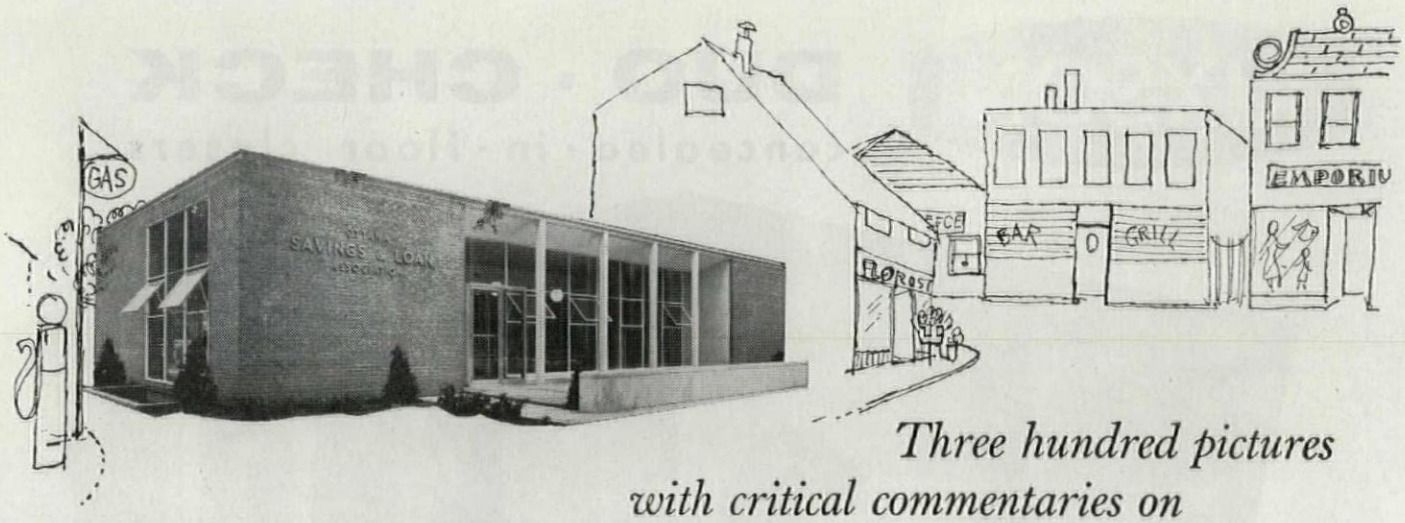
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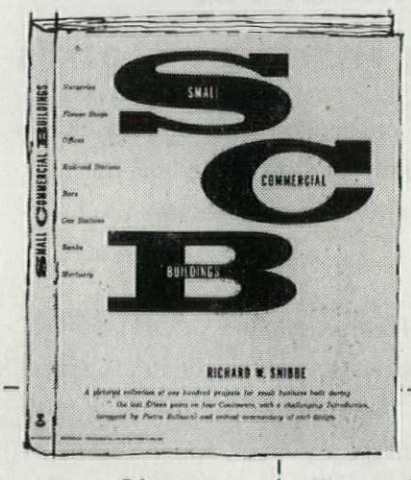
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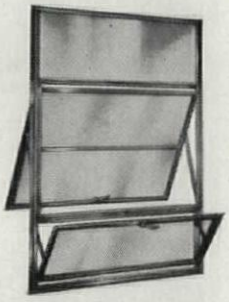


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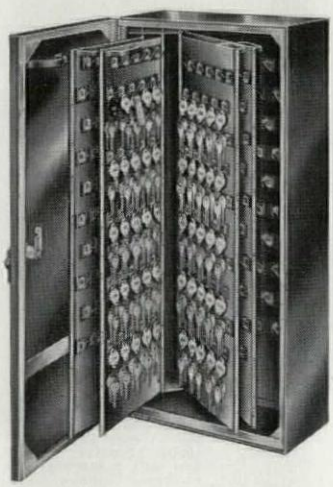
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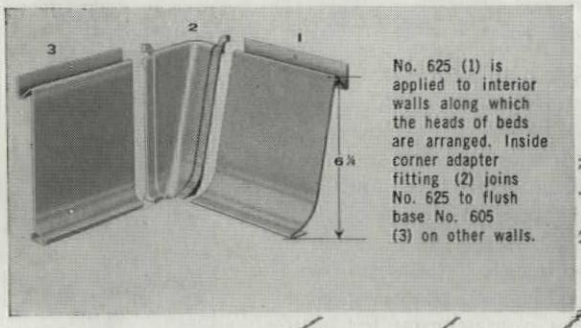
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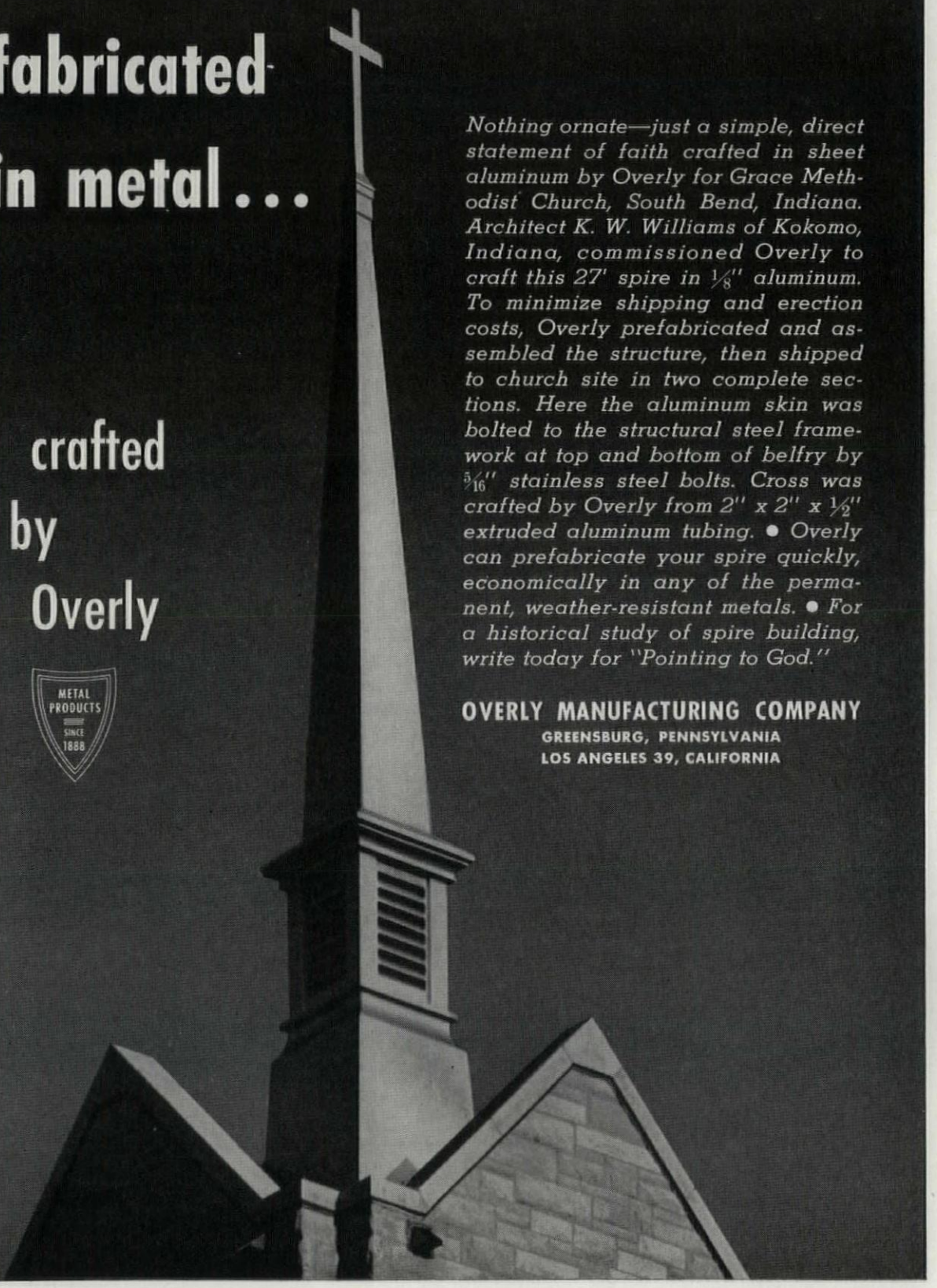
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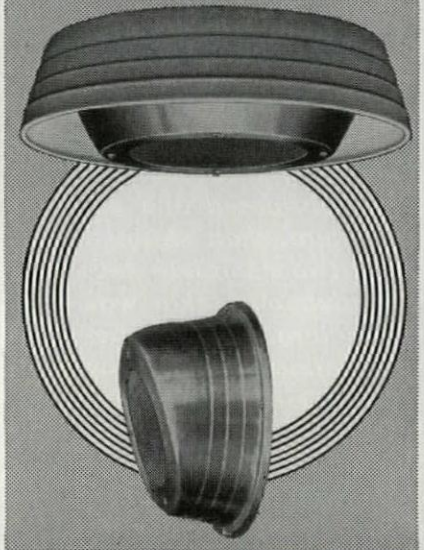
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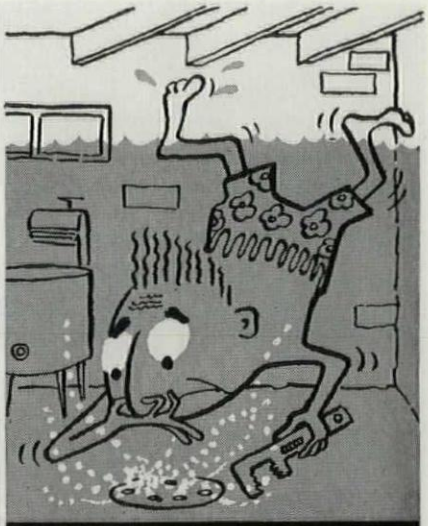
(Continued from page 254)

East. Especially his New England and Virginia Calendars, which we enjoy daily, have aided our architectural awareness. We cannot know our architectural history until we have first looked at the buildings with seeing eyes. We are usually going at such a pace that we can not stop to look. Therefore, we are indebted to Chamberlain, who, through his photographs, brings the buildings to us.

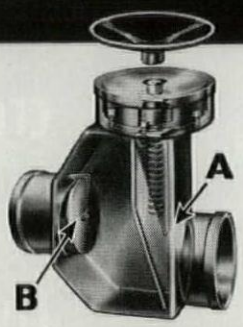
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I am sure that the befuddled visitor will be grateful and not cavil at the spelling of "Edinborough" or omissions in the index. Neither will they miss the information which is available in *Architects of Charleston* by Beatrice St. Julien Ravenel and is not used in the brief captions. People who have visited Charleston will be delighted, for their memories will provide the color and scale which give the personality of a room but which cannot be captured by photography. AGNES A. GILCHRIST



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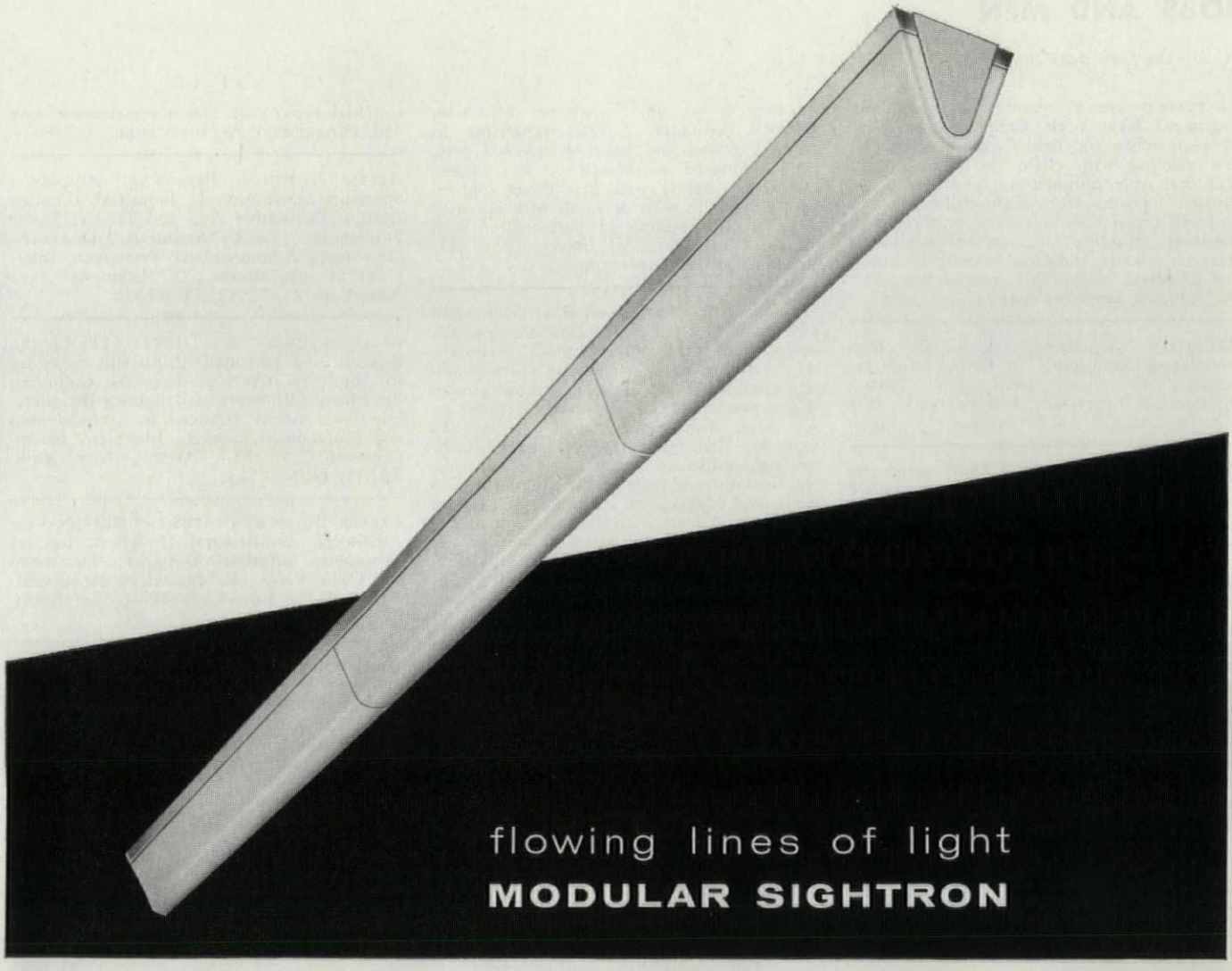
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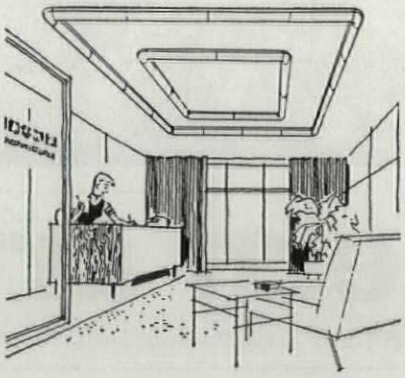
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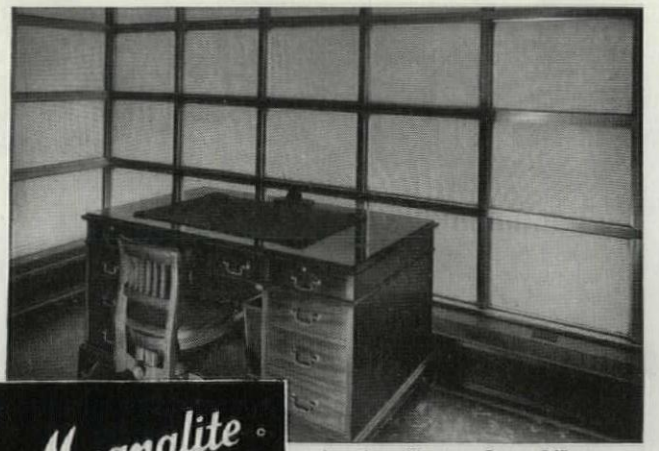
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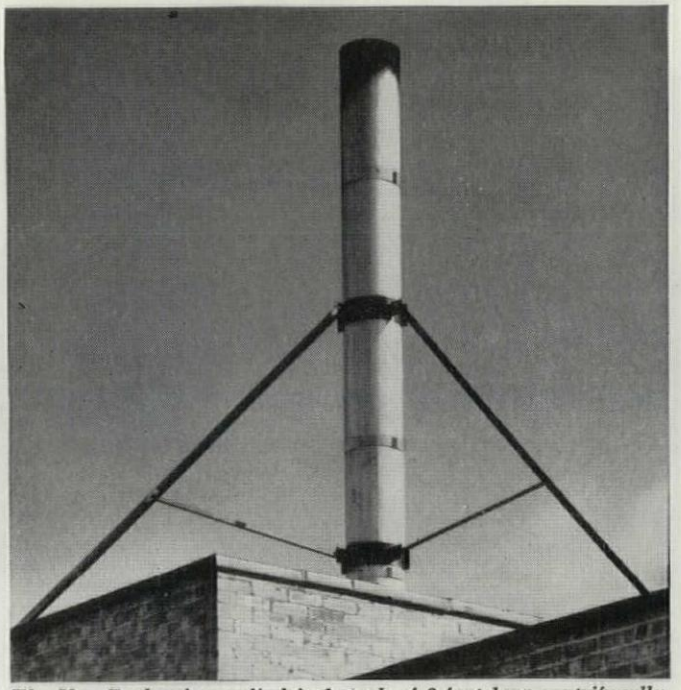
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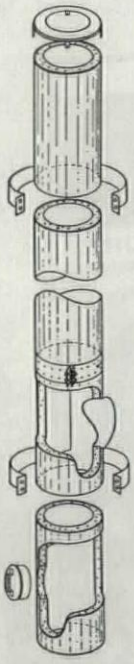
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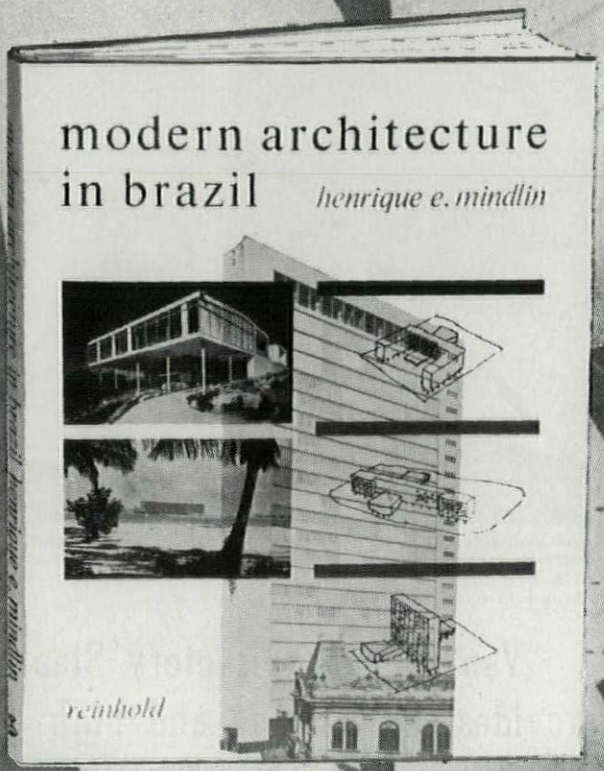
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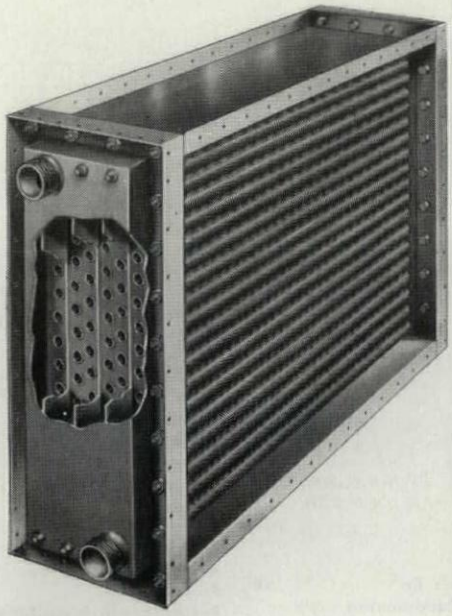
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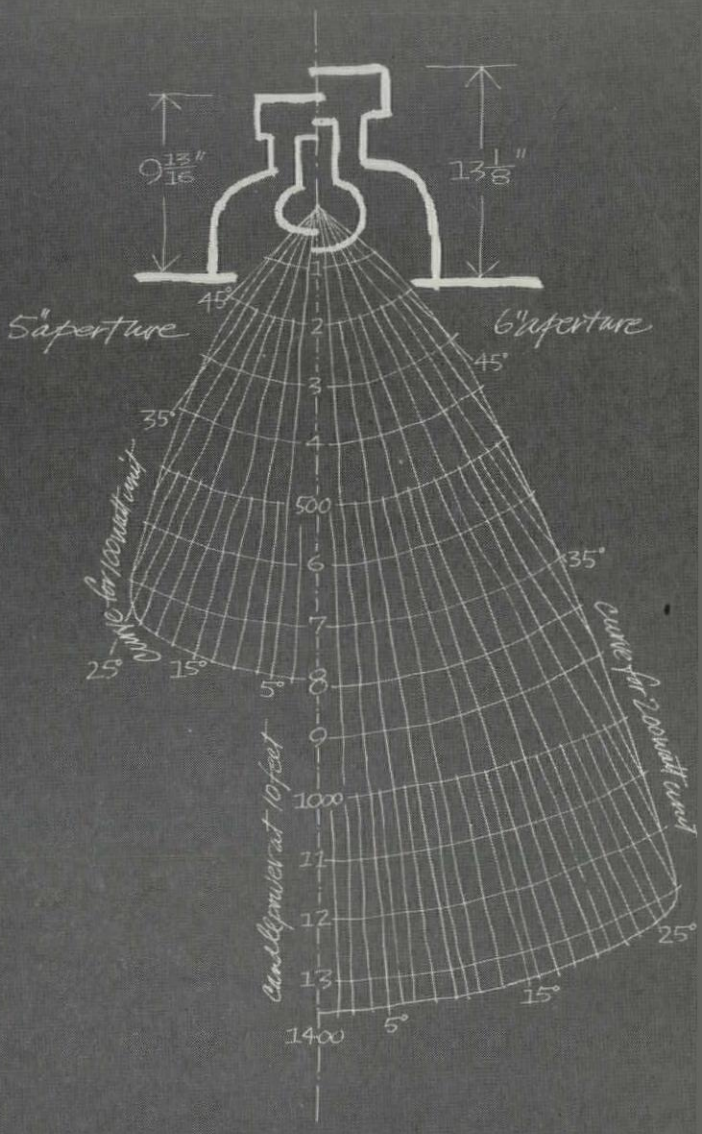
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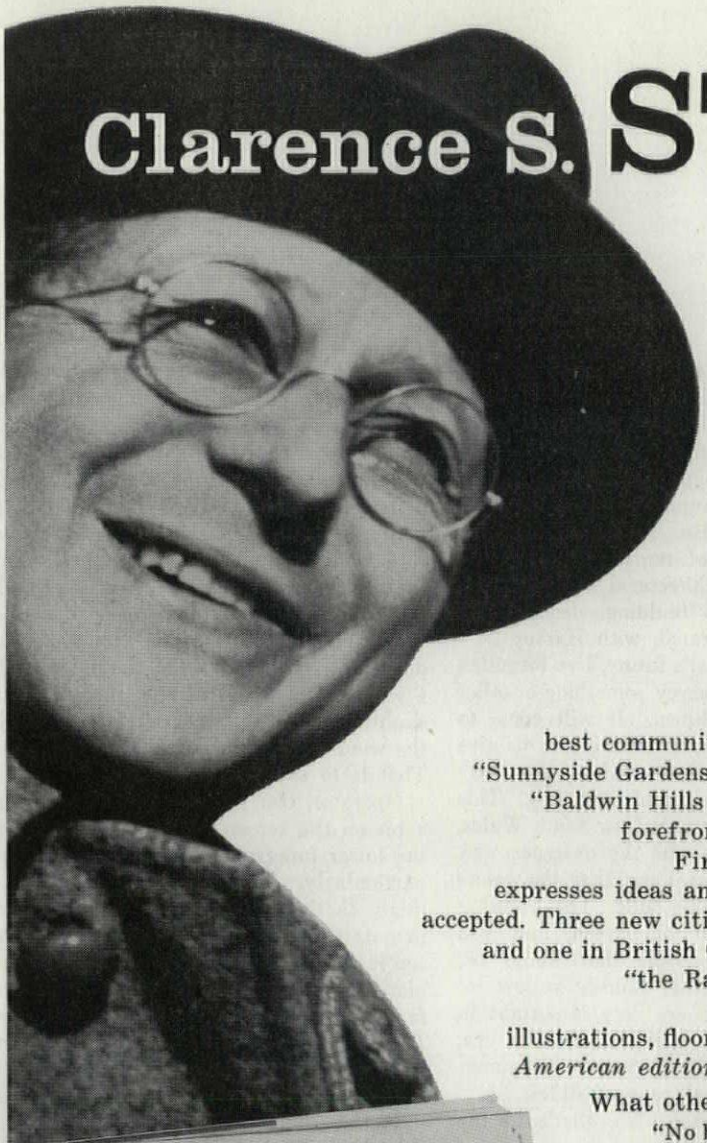
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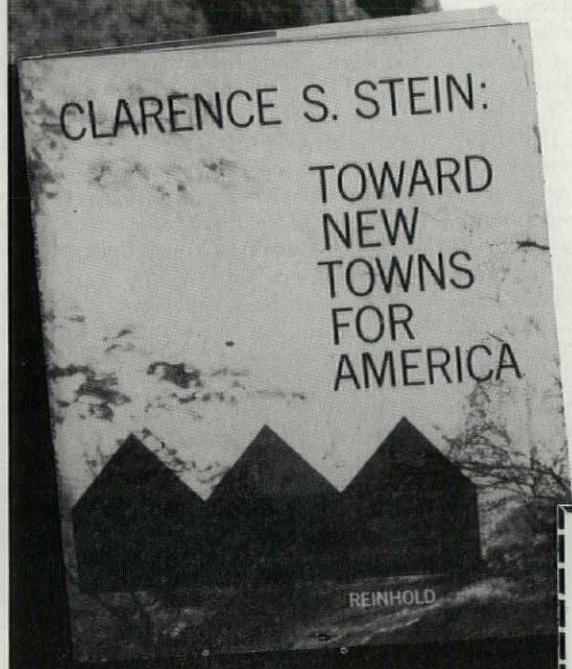
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I have the greatest admiration *for anyone who can handle a lecture with slides. There is real art to the business of keeping the attention of an audience as speaker, while leading that attention away from yourself by showing pictures on a screen. And as speaker, what do you do yourself—maintain that firm gaze on the wandering eyes of the people before you, as any good lecturer knows he should, or turn nervous glances to and from the screen, to be sure that the right slide is on, and that it is on right? All too often the slide talk can go something like this (and if anyone thinks that I am poking cruel fun at others, believe me that this same sort of thing has happened to me more often than I like to remember):*

Now that I have made my main points, ladies and gentlemen—first, that the design of quasi-industrial buildings has reached a point of frustrated super-auditory semi-completeness, and second, that this is undoubtedly due to the incapacity of the interdependent design disciplines to maintain a consistent visual-empirical hypothesis—I want to illustrate some additional attitudes supporting the argument, by slides.

Now, if we may have the lights off, please—the first slide . . . does some one know where the light switches are, please . . . no, now that turned off the projector. That's fine, thank you. Now this first slide is . . . excuse me, let me find the little light here on the rostrum, so that I can see my notes. Where is that—oh, here we are. No, now that turned on the footlights, didn't it? Oh well, I can undoubtedly remember what these slides are.

Now this first one is not exactly the building I wanted to illustrate for this point. It is alongside the building I had in mind showing you, but I was using a new camera when I took this shot, and I wasn't quite sure of the picture I was getting in the viewer. It makes a point, however. Notice the relationship of mass to void here. I realize that I had made exactly the *opposite* point in my remarks earlier, but this slide proves what I was saying by exception, so to speak. The other building I wanted to show you would have illustrated exactly the reverse, but I'm sure you get the point.

Next slide, please. No, that comes later—I think that's numbered 16, isn't it? It must have gotten out of place in the box. As a matter of fact, I thought that I had eliminated this one, because here the voids and the solids, so to speak, are indistinguishable. The picture was taken on a very foggy day, which accounts for some of that impression, I'm sure.

Next slide, please. Now what we have here is a result of remarkable collaboration between architectural and engineering groups. This building, designed by Tek-nots, Incorporated, with Harvey . . . Harvey . . . now that's funny, I've forgotten his last name. Harvey something-or-other as consulting architect. It will come to me later, I'm sure. I always like to give proper design credits. Oh no, that isn't that building, now that I look at it. This is an industrial plant in New South Wales, and I don't know who the designer was. Now I want to point out that the colors aren't correct in this slide. The building is actually a soft blue-green, and you can see how handsome that would be, instead of this rather muddy yellow we have here. Colors are very important in understanding this aspect of architecture, and that's why I have some kodachromes like this one in the group of slides.

Next slide, please. No, that's upside down . . . I think. Let me see a moment. Yes, that's right, it's upside down. Can you turn that over, please? No, that's sideways now. Please try again. I'm afraid that's wrong, too—that's sideways the other way, so to speak.

Now while this is being turned around, I want to tell you about this building. In itself, it's not particularly interesting, but it is built on the site of the first factory ever designed to manufacture electronic fountain-pen parts. The earlier building was torn down just after the war, and this rather dull one built in its place. So you see the slide has an historic significance, so to speak, which is why I want to get it straightened out for you.

No, I'm sorry, that's backward now—the telephone pole in the foreground should be on the left-hand side instead of the right. No—that's both backward *and* upside down. Oh dear, and that's sideways again, isn't it—and backward, too?

Now wait a minute, operator . . . there are only eight possible ways that slide can be put in the projector, and one of them must be the right way—and you have shown us nine wrong postures, so to speak, haven't you? The man is a genius.

Well, let's go on to the next slide. Next slide, please. No, that's the same slide. Let's not go through *that* again. No, I'm sorry; that's that number 16 that was out of place, isn't it? Fine, that's better; that's fine. Let's hold that. Actually, this is in backward, too, but I'm sure you can see it nevertheless. Now that entrance feature on the left—actually it's on the right, of course—is placed in subtle counterpoint to the group of windows . . . you can't see them too well, I realize; that part of the photograph is slightly out of focus, isn't it . . . well, the window grouping *is* there on the right. That is to say, the left.

Operator, can you move that picture up a bit on the screen? There is a detail in the lower foreground that I want to show particularly. No, that's too far up . . . there, that's fine. Now the detail I want to point out . . . well, that's odd, I don't see it there. Operator, can you move that picture *down* a little on the screen. No, farther. Well . . . I see what's wrong now. That detail—the planting related to the focal part of the composition, is at the *top* of the picture. I realize now that we have this slide in upside down as well as backward. But you can see the point, I'm sure. The relationship is obvious, isn't it? Perhaps if you turn your heads to look upside down at it. . . . No, no . . . please don't do that! It was a bad suggestion. That's very confusing for me, to have you all looking at the screen upside down. You can't look at it backwards, in any event, can you?

Well, perhaps I had better go back to the third subject of my talk and consider that these slides we have seen have made the points sufficiently well. May we have the lights on, please? No, those are the footlights. Oh, there's the little rostrum light, isn't it? But the main auditorium lights . . . may we have those, please. There, thank you.

Now the third category of this aspect of design . . . oh, incidentally, that architect's name is Harvey Footloose. I'm glad I remembered that. I don't like to leave any loose ends, vague points, or unidentified credits in a slide lecture. Now the third category . . .

Thomas H. Creighton